

RACE TRUCK OF THE YEAR: LOSI JR-XT

April 1991

47380



Radio Control CAR ACTION

THE WORLD'S R/C CAR MAGAZINE

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ON THE COVER: Dominating the cover is Tamiya's Bullhead. Upper right: Team Losi's JR-XT was unanimously voted "Truck of the Year" by the *Car Action* staff. (Photos by Yamil Sued.)

EDITORIAL

by STEVE POND



Off their medication and on the loose, the Car Action editorial staff (from left): Staff Photographer Yamil Sued, Executive Editor Steve Pond, our lovely Managing Editor Li Agen, Alleged Editor Chris Chianelli, Group Publisher Louis DeFrancesco Jr., Associate Editor John Huber and Junior Associate Alex Strouthopoulos.

FREQUENCY FRENZY

I greeted a recent development in the R/C industry with great enthusiasm. It was news of a whole slew of new frequencies for surface vehicles, i.e., cars and boats. With the few frequencies currently available and an increasing number of regular racers at the track, it's difficult to set up heats without having two or more drivers on the same channel.

Initially, the new frequencies sounded like a great thing for R/C racing, but I later discovered that the new channels might eventually cause more problems than they solve.

All the new frequencies are on the 75MHz band. Currently, all the 75-band channels are even-numbered frequencies (e.g., 66, 68, 70, etc.). These channels are separated by 40MHz, which is what's required with radio systems that have a tolerance of ± 20 MHz. For example, channel 62 is 75.430MHz, while channel 64 is 75.470MHz. The new frequencies are odd-numbered and fall between the existing frequencies. Now, there will be a channel 63 (that's 75.450MHz) between the 62 and 64, and an odd-numbered frequency between all the others.

This means that if a current radio (with a tolerance of ± 20 MHz) is out of tune, it won't be a matter of occasional interference: now, the interfering signals will almost be able to drive your car! Basically, the space between the old frequencies and the new ones is too narrow for the type of systems we use, and unless race directors take great care to avoid radio problems, interference will double.

Perhaps it's a little early to react to a situation like this, because any plan requires a lot of thought before it's put into action. The problem is that the FCC offered these channels—and *only* these channels—to R/Cers. It was either take 'em or leave 'em. If we had decided not to take them, the frequencies would have been allocated to remote "beepers" (or other similar equipment), and that would have been worse. I guess you could say that accepting the new frequencies was choosing the lesser of two evils.

Some have suggested solutions to the problem of having radios on such close frequencies, e.g., don't allow the use of odd-numbered crystals (this would be hard to enforce); allow them (this would increase the burden on race directors who set up heats); or allow them, but make racers buy systems that have ± 10 MHz tolerances (but these cost more than the currently available systems).

I think the extra frequencies could be something of a "Trojan horse" if the situation isn't handled properly. There are several potential approaches, but it will be a while before the dust settles. Any suggestions?

Radio Control CAR ACTION

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LETTERS

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, owing to the tremendous numbers of letters we receive, we cannot respond to every one.

FIGHTING FULLER

Here's a letter that was published in the December 15, 1990 issue of "The Starting Grid," the Team SEMROCC Racing newsletter.

Ralph Fuller died last Friday evening. He was just 17. I met him last June at a SEMROCC race at Freedom Hill. He was the only one at the track having as much trouble racing as I was, and I started to help him. Ralph also had trouble climbing the steps to the drivers' stand and walking around the track. He told me he had asthma. We became friends—really good friends. He became my "kid brother."

Ralph's mom told me his "asthma" was really cystic fibrosis. I didn't think much about it until I saw a TV show on CF. It's an incurable gene disorder, and most CF patients don't live much past their 20s. That really shocked me, and I started to do a little more for and with Ralph. Because he didn't want any special attention, he didn't want anyone at the races to know he had CF.

Ralph's main thoughts were of R/C car racing at Freedom Hill. He started out with a Hornet, and then he bought an RC10 and put it together by himself. He began racing it the spring before I met him. A lot of people at SEMROCC helped Ralph improve his car's performance. With all the help, Ralph did better in the races, and his car stopped breaking—much more fun (and much more satisfying when the racing's done!).

Ralph went into the hospital right about the time of the Sportsman's Cup Race, and all of his R/C car mags, tools and his RC10 went with him! I secretly asked ROAR President John Thawley if he could get one of the Sportsman's Cup celebrities to call Ralph. John did better than that—he stopped by with

Joel "Magic" Johnson! I was in the room when John, Joel, Ernie Provetti and Steve Pond showed up. Ralph was shocked! Steve shot a whole roll of film, and they gave Ralph some autographed T-shirts and things. It was probably the neatest thing anyone could have done for Ralph, and he talked about it for ages. A few months later, one of the pictures was published in *R/C Car Action*. It was in a special box under the title "Fighting Fuller" (very appropriate). I gave Ralph the magazine. That day, he was a real celebrity at the hospital! Thanks, John, Joel, Ernie and Steve!

Mike Blackstock first met Ralph at Freedom Hill and then at JJ's where Ralph was trying to race on the oval-carpet track with a Bolink that I had given him. Mike started giving Ralph advice, his ribbons (usually 1st place) his JJ's Winner's Cash Cards (which Ralph used to buy parts for his RC10) and then an autographed 1st-place trophy. (Mike won it when he set a new track record at JJ's.) Ralph was really proud of that trophy.

Ralph and I had many long talks. We were going to write an article for a CF newsletter about R/C car racing. It's hard for people with CF to compete in physical sports. R/C car racing, however, is more of mental sport, so it's perfect for them.

Mike Blackstock told me to remember all the good times Ralph and I shared. Team SEMROCC was probably the biggest, best and most enjoyable part of Ralph's life. I think it's really wonderful that Ralph and Team SEMROCC got together. Words can't express how much it meant to him.

Goodbye, Ralph.
Love,
MIKE MYERS

CHAMPION?

After I read your Championship RC10 review, I re-read your article on the 1990 World Championships in Australia (February '90 issue). The World Champion "Stealth" car clearly isn't the same car as the "Championship RC10." Although a Stealth transmission is now available (it isn't included in the Championship RC10 kit?!), the Stealth car has a graphite chassis, a narrow front end (spy shot on page 51), and a "mongo" suspension travel with high-tech shocks. The Championship RC10 doesn't have any of these features, yet Associated's ad in the December '90 issue (pages 36-37) describes it as the "1989-90 IFMAR World Champion" (which suggests that it's the same car that Masami used.) What garbage! This type of misinformation also occurred in the previous World Championships when a factory-modified Ultima wowed the world. It wasn't at all like the one that was sold to the public!

It's time for a great mag like *Radio Control Car Action* to expose the R/C car manufacturers. As for the Championship RC10, I'll take a JRX-2 Pro over it any day! It's unfortunate that Associated has re-kitted a great car like the RC10 so many times that it no longer deserves the prestige it earned during the 1985-86 World Championships.

Also, why don't you use identical tires on the cars in your track reports? It made a big difference in Australia.

GIB LICHSTEIN

Gib, I'm sorry that you weren't happy with my Championship RC10 review. The Championship RC10 isn't based on the car used in Australia. It's an updated version of the original kit with some of the graphite car's features! As for the "Stealth" car, I don't know whether Associated plans to manufacture one or not.

Companies like Associated spend a lot of time and money on developing new products, but not all of them reach consumers (although those that satisfy the company usually do). Associated's new

"Team" car boasts many of the Stealth car's features, including improved versions of the hard-anodized shocks, a choice of graphite or aluminium chassis and the special transmission (see the "Associated Stealth" article in this issue). As for a design using the narrow front end, the company has no plans to produce one. (Apparently, this setup doesn't work in all conditions, but I'd love to see one hit the market so that I could decide for myself—hint, hint!)

Testing cars using identical tires is a good idea, but it's impossible. Although we might change a thing or two owing to driver preference, we try to test the cars "as is"! In addition, there are many variables that affect a tire's performance (temperature, track moisture, the type of dirt, etc.), so tires never react in the same way twice. Why don't you "scope in" on other features and just keep a variety of tires on hand so that you're ready for whatever comes your way? JH

STEALTH CONTROVERSY?

I'm an engineer/scientist for a major defense contractor. When I'm not working, I love to race my RC10L at the local track. I've raced R/C cars and monster trucks for about 3 years, and I participated in the last Thunderdrome. There are a couple things I have to get off my chest.

Several R/C car and hop-up-parts manufacturers have been labeling their products (cars, transmissions, batteries, etc.) "stealth." The word "stealth" means "radar elusive" or "having radar signature-reducing characteristics," and R/C companies that label their products with this word are using it incorrectly. Although I think (but can't prove) that an R/C car has a small radar cross section, if it used stealth technology, it would be almost invisible to radar. (It's said that the B-2 bomber has the radar cross section of a bee.) I don't know what good having a radar-elusive R/C car would be in an A-Main.

(Continued on page 20)



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BAD BOYS

B. Hoffman's (of Itasca, IL) super Clod Busters are brothers in badness. When someone bugs baby brother, big bad brother bails baby out! With Matched Madness motors, 12 cells for motivation and a "trailerful" of powerful modifications, nobody better bother big brother. Watch out world—here they come!



RACE ROD



Have you ever thought about creating your own car? Joseph Pieczynski of Flanders, NJ, did more than think about it. Under this bright red, three-window '33 Ford coupe body is a homemade car! Joseph cut the fiberglass chassis to give it a pan-car shape. He incorporated a 10L front end and a custom-built rear suspension. The rear, stainless-steel pivot pins project upward from the

chassis, and they pass through rubber grommets that are installed in the rear pivot yoke. The pin closest to the gearbox is spring-loaded, allowing upward flex, while the grommets allow side-to-side roll. For the drive system, Joseph converted a Kyosho Javelin tranny to 2WD, and it really handles the motor's power! There'll be more about Joseph's scratch-built race rod in the future.

CRAZY CONVERSION

You've heard of converting a car into a truck, but what about converting a truck into a car! Ernesto Melo of Woodland Hills, CA, started with a JRX-T, and he added (and subtracted!) parts until he had a JRX-Pro! In addition to all the new Pro parts, he used one of Novak's new 410 M1c ESCs, MIP's new hard-anodized, Teflon-coated shocks, Futaba radio gear and a Twister motor. The hot paint job is perfect for such a hot racing package!





ALVIN'S BLACKFOOT

This matching pair was sent in by Ronald Lane of Marion, OH. Alvin (the chipmunk!) is at the wheel of the Blackfoot, and the Varicom Firehawk sits on a matching custom trailer. With a Technipower motor and oil-filled shocks, Ronald's Blackfoot can really make waves!



Futaba ESC and radio-gear. When he saw the model, Robert was so impressed that he wanted one! For spreading the joy of R/C to someone in the full-size car racing world, a hearty thanks goes to John for this awesome effort!

MUSTANG MANIA

Trans-Am racing is one of the wildest, wooliest forms of full-size road racing. Because these ultra-wide racing machines resemble their street counterparts, the races are exciting. An ardent fan, John Twa of Rapid River, MI, made a model of the JPS Mustang that's driven by Robert Lappalainen of Finland. Under this



SWEDISH SUCCESS

This Reader's Ride comes from the land of the Vikings! Lars-Erik Waern of Gothenburg, Sweden, put a graphite RC10L chassis under this slick Electrolux Thunderbird body. With such trick items as a Tekin 700, an LRP German motor, Tecnacraft wheels and a Sanwa Exerd radio, Lars is ready to blast the competition!



T-BUCKET TRICKS

After he read our article "How to Build a T-Bucket," Steve Ibershot of Grand Rapids, MI, decided to build one. He put the frame of a Golden T-Bucket model on a piece of fiberglass and custom-cut a chassis to which he added the model's exterior and a Parma Hemi engine. The car's details include a full interior with simulated leather, engine wires and a "trick" removable roof! Because it's meant for cruising, this car is more show than go. When people see it on the street, however, their expressions make all the effort worthwhile!

MASTER OF THE QUARTER MILE

Some people like to drive on flat roadcourses; others like the high banks of a superspeedway; and still others, such as Carlos Colón Cordero of Moca, PR, prefer to drive straight ahead—very, very fast! This '67 Chevelle (a copy of Gordy Fourst's full-size '66 Chevelle) has a funny-car chassis, a Novák 828 HV ESC and an Astro Top Fuel motor. When it comes to the scale quarter mile, Carlos must have the fastest car in Puerto Rico! For this "effort supremo," Carlos gets the subscription of honor.



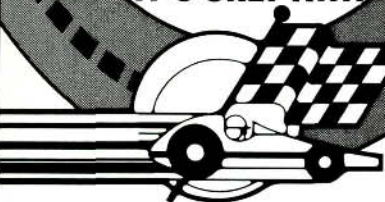
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PUBLISHER'S PAGE

by LOUIS DeFRANCESCO, JR.



Pictured here is my first hot rod in its early crude stage—a classic '57 Chevy I bought for \$175 in 1971. Much of what I learned about building and modifying came from a voracious reading of automotive magazines. I vividly recall a series called "Project X," which was featured in "Popular Hot Rodding" magazine and was especially helpful. With each issue, we strive to help R/C car enthusiasts with their modeling endeavors; we plan to feature even more "how to" information.

THERE HAS recently been much discussion in the Air Age Publishing conference room about the editorial direction of *R/C Car Action* in '91 and beyond. Because of our national newsstand distribution, we must be working on a magazine three months before its cover date, i.e., the production of this issue began in January, though the cover date is April. Of course, we plan many months ahead and know in January what we'll feature in the September issue and later ones. There are always article slots left open for late-breaking product information and developing trends, and that brings me back to the thrust of this page. The editorial staff and I see an even greater need for basic "how to" information, and this will be addressed with more regularity in upcoming issues. There will also be more money-saving tips, information on modifications and readers' projects.

The adverse economic climate has also dictated that we provide more help to readers. We know that many of you are on budgets, and we want you to get the most out of your hobby. It's our editorial responsibility! Our successful *Radio Control Action Series* publications will also reflect this policy. The next one will be called "*Radio Control Car Basics*" and will feature a wealth of information on building, finishing and modifying—plus a slew of neat low-budget tricks.

During my full-scale hot-rod years in the early '70s, I read many automotive magazines to learn as much as possible. I remember most vividly an article series called "Project X," which was published by *Popular Hot Rodding*. In the series, they took a bone-stock and tired old '57 Chevy 210 sedan and modified it into a hot street machine. The series also contained a plethora of modifying tips and product information for the hot rodder who didn't have big bucks—like me. It really helped me, since I was working on a '57 Chevy Bel Air coupe at the time! "Project X" will always be with me, and we aim to help our R/C readers in the same way. If we've helped, we've done our jobs! I understand that Argus, the publisher of *Popular Hot Rodding*, has updated the series and published it again. I hope that, 20 years from now, our readers will reminisce about some of the *Car Action* features that helped them!

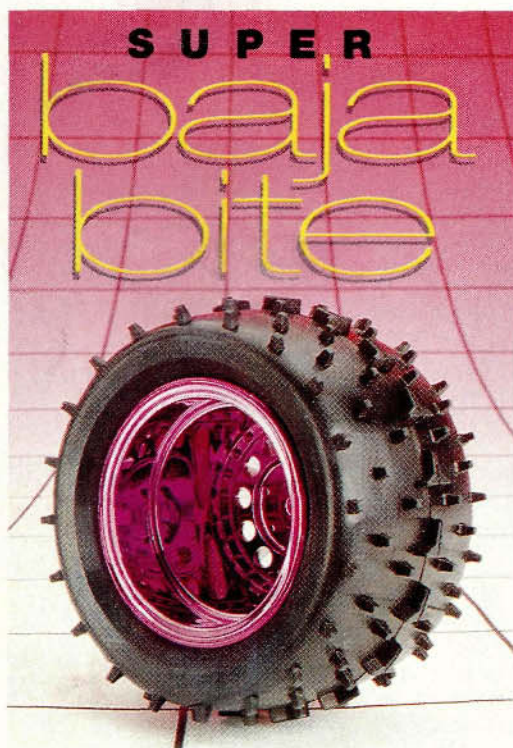
INSIDE SCOOP

by CHRIS CHIANELLI



As directed by the Ayatollah of Radio Controlla, Commander Crash Chianelli reports back to the faithful followers of the Grand High Exalted with pertinent information! I'm back from my latest espionage excursion with microfilm, spy shots and stolen communiques that read as follows:

The latest tire in Trinity's off-road truck Baja line is this Triad design, "ultrabite," natural-rubber. 2.2-inch rear tire. According to Ernie Provetti, "This tire will eat alive another tire when it comes to low-traction, loose track conditions." Its part number is 7505.



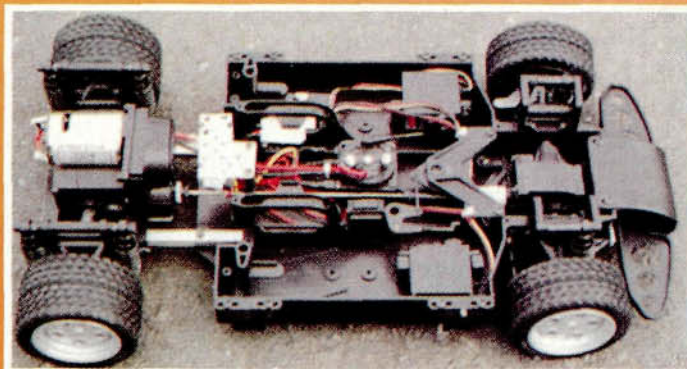
SCALE EXOTICS



Great Planes Model Distributors hasn't yet decided to import these beauties, but I think the 1/10-scale Lamborghini Diabolo and Jaguar XJ 220 are wild enough to show you anyway. Each is 4WD and has an ad-

justable wheel base and an in-line motor mounted over the rear gear case—a new touch. They're reported to have awesome scale detail that includes finely appointed interiors. In 2WD, speculators say the

Merkur XR4Ti could be the next addition to Kyosho's scale series on the Ultima II chassis.



CHAMPION CHILD

Michael Taylor took his sons to the 4-Cell Indoor Championships in Cleveland, and the event was even more educational than he had anticipated: his sons were given a great lesson on poor sportsmanship. The teacher? Chris Doseck; he dumped in the A-Main and lost the race, and instead of setting a good example, his behavior was bad enough to make Mr. Taylor write to us. We've verified the accuracy of his account by talking with others who were at the Championships. Mr. Taylor writes:

"My boys, ages 10 and 13, are avid R/C car nuts, and they were really looking forward to seeing the IFMAR World Champion, Chris Doseck. He's my youngest son's idol, but I wish I had never attended the race. The exhibition put on by Doseck, CAM Motors and their supporters was a disgrace. I've never seen such a bunch of babies and poor sports in all my life."

Mr. Taylor describes Doseck's behavior immediately after he lost the race:

"The display I witnessed was absolutely appalling. World Champion indeed! Before storming off the drivers' stand, Doseck broke his antenna, smashed his transmitter into the wall, told Ernie Provetti and Mike Reedy to 'F*** off!' and knocked a young spectator off a chair. I won't attend any other races in which he's a competitor, and I won't buy any CAM equipment. It's time to take a stand. If ROAR won't do something about this type of behavior, then we equipment buyers should! My son Todd summed it up best when he said, 'I guess he didn't deserve to win.'"

Right on! Chris, you didn't deserve to win that day, but you do get our "Gold-Plated Pacifier" award for poor sportsmanship.



He's \$25,000 Richer

Eighteen-year-old Chip Hyde from Yuma, AZ, won the big money at the 1990 Tournament Of Champions in Las Vegas, NV. He has been a modeler since he was three, and he's now considered to be the world's best R/C pilot. I love R/C airplanes, but cars are my first love, and I'm mad that the airplane people show us up by giving their competitive events professional treatment. Considering the size of our hobby, it should be the other way around! Am I right, or am I right?!

NEWS FLASH

Motor-timing decision

Starting in April, all stock motors will be limited to a maximum of 24 degrees of timing. All armatures will have a standardized means of preventing owners from realigning the commutator and armature stacks. All new ROAR-approved stock motors will be required to have "ROAR 91" stamped onto the face of the can.

TWISTER ECONO STOCK

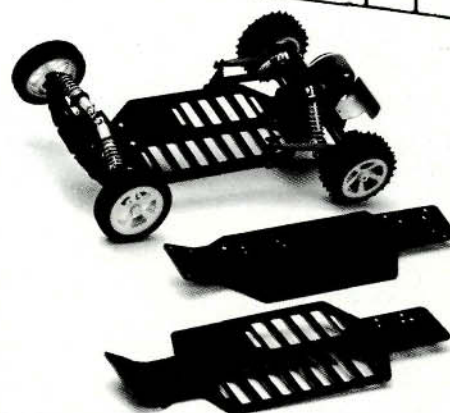
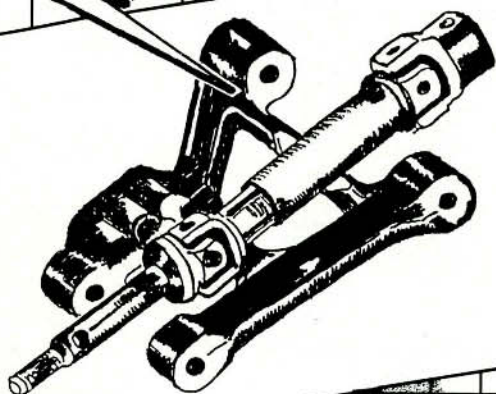
According to Mike Walker of Twister Motors, the new Econo Stock, which lists for only \$19.90, "gives great performance without the high cost or short lives of today's hot stock motors. Its speed, reliability and low cost also make it a logical choice for novice and club racing.



A 27-turn motor with 24-degree timing, the Econo Stock meets ROAR and NORCCA's proposed '91 rules." The Econo Stock has replaceable brushes for longer life and easier maintenance.

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59.95	1020	JRx2 Lefthand Oval Chassis, 30°, ½ Longer	
69.95	1021	JRx2 7 & 3 Oval Slotted Chassis, 30°, ½ Longer	
59.95	1040	Ultima Lefthand Oval Chassis, 30°, ½ Longer	
69.95	1041	Ultima 7 & 3 Oval Slotted Chassis, 30°, ½ Longer	

RC-10 Telescoping Drive Systems			
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Batteries			
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<i>For a Catalog Send \$2.00</i>			

Dealers Contact Hobby Dynamics Distributors
Great Planes Model Distributors

HOT NUMBERS

Eagle Product's Gino DiFillipi does it again! with colorful artistry. Like the rest of the Eagle line, these bright numerals can be applied to the inside of a car body before it's painted, and this gives a cleaner, more durable finish. There are also other designs in a variety of colors, e.g., the "color gradient" panels also shown here. For more information, or to pay your respects to Gino Don DiFillipi, contact Eagle Products, 754 Dodsworth, P.O. Box 4609, Covina, CA 91723. Tel: (818) 339-1311.



CAR ACTION REGATTA

Sponsored by *R/C Car Action* and Trinity, April 5 and 6, 1991, will see the *Car Action Regatta* at the Oasis Hobby Park, in Spring, TX. This beginner-level event is for out-of-the-box, plastic-only kits. Classes will be: deep-vee; semi-vee; catamarans and flat-bottoms; hydro and outboard tunnel hulls. The sub-classes will be: 7- and 12-cell; single and dual motors; stock and modified motors. For more info, call the Oasis at (713) 537-6347.



Sponsored by:

- *R/C Car Action Magazine*
- *Trinity*
- *MRP*
- *Traxxas*
- *Oasis Hobby Park*

April 4: open practice

April 5: check-in - 9 a.m., drivers' meeting - 11 a.m., qualifying begins at noon

April 6: qualifying and main events

Place:

Oasis Hobby Park
4307 Treaschwig Rd.
Spring, TX 77373
(713) 537-6347

Hotel information:

Holiday Inn
16510 N. Freeway (I-45)
Houston, TX 77090
(713) 821-2570

(For special rates, mention Oasis Hobbies when you make a reservation.)

R/C CAR ACTION REGATTA



April 4, 5 & 6

All boats must be stock. Limited to kits with plastic or polystyrene-type hulls. The only modifications allowed will be props, speed controllers, trim tabs and rudders. No modifications to the original hull will be allowed.

Entry Fees:

Modified - \$20
Stock, Single Motor - \$30
Stock, Dual Motor - \$40

Make checks payable to:
Oasis Hobbies.

Send to:
Oasis Hobbies,
P.O. Box 691831,
Houston, TX 77269.

Classes (check one or more):

- ☐ 7-Cell Stock, single motor
- ☐ 12-Cell Stock, dual motor
- ☐ 12-Cell Modified, single motor
- ☐ 12-Cell Modified, dual motor

Hull type:

- ☐ Vee
- ☐ Offshore Cat
- ☐ Hydro
- ☐ Tunnel

Freq. choices:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Daytime phone: () _____

FIRE WATER



October 21, Maysville, WA: Jim Auguston establishes an official world record at the APBA Record Trials on Twin Lakes. With his Astro Cobalt 40 marine-engine-powered outrigger (shown here), Jim broke the 60mph barrier with an astounding 65.601mph and a two-way average speed of 61.788mph. Jim used a 32-cell 600mA pack and an Astro 207 Hydro-Speed

electronic speed controller. Jim also managed an amazing 61.266mph in the 18-cell Class, again using an Astro 05, but with an outrigger that he designed.

RADIO ACTIVE

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LETTERS

(Continued from page 9)

I also think there should be a way to differentiate between racers who have sponsors and those who don't. Racers without sponsors have to buy parts with money out of their own pockets.

I suggest the following solutions:

(1) Use military terminology for R/C car products. Currently, the military is working on projects with such names as "advanced-technology aircraft," "advanced tactical fighter" and "enhanced-maneuverability aircraft technology demonstrator." (2) Borrow terminology from the motocross world. Riders with factory sponsorship are called "factory riders," and those without are called "privateers."

Come on, guys! Let me see some factory racers compete against some privateers with store-bought cars equipped with advanced-technology transmissions and enhanced-technology batteries.

HENRY BANUELOS
Lakewood, CA

Sorry, dear; you lose. It's a good thing I read your letter before the copy editors in our Editorial Department did: they would have eaten you alive. I know this will come as a shock, but the military doesn't have a copyright on the English language. My Oxford English Dictionary cites the first written mention of "stealth" as 1250 AD. "Stealth" isn't best described as a radar-elusive technological wonder, as you claim. If you'd ever read anything besides military spec sheets, you might realize that the word evokes many rich connotations. To be stealthy is to be furtive, sly, artful, crafty, cunning, foxy...I could go on. Thus, manufacturers who label their cars, parts, or accessories "stealth" are implying that these products will enable you to elude your competitors in a noiseless, catlike way—for a lot less than it costs to build that oh-so-economical Stealth Bomber, I might add.

It doesn't surprise me that the military still uses names like "advanced-technology enhanced-maneuverability tactical militaristic way-over-budget-and-probably-won't-work-anyway aircraft dem-

onstrator." After all, these are the people who brought us "terminate with extreme prejudice" as an alternative to "kill." An overblown name doesn't make a jet fly or a car cruise, and I'd choose "Stealth" over "Mega Pro-XL Mid Graphite Turbo Championship Gold Edition Xtra Sport LTO Ultimate Deluxe II" any day—especially when it comes to fitting them into our winners' charts. LA

Henry, you upset the redheaded Ms. LA! (Remember what happened to Samson when he made Delilah angry?) I agree with her. I think the "stealth controversy" is in your mind. As for the sponsorship "problem," I guess we could call unsponsored racers PRPLOCs (Poor Racers Pitifully Low On Cash) and the sponsored ones LRDPFNs (Lucky Racers Don't Pay For Nothin'), but I think the racing public knows the difference between the two. Can't we just leave it at that? CC

V8 POWER

I'd like to congratulate you on a first-class magazine. I just saw WCM's new '34 street rod in *Street Rodder* magazine, and I was stunned by the car's realism. A few months ago, I heard of someone who makes and races 1/4-scale V8s! Can you give me information on the engine, or how I can contact that person? If such an engine exists, would it fit it into WCM's '34 rod?

MATT SAUGLE
Santa Maria, CA

Matt, the engine you refer to is the Conely V8. It's a glow-ignition engine that runs on a methanol/alcohol mixture that's similar to the mixture used in the .21 glow engines in 1/8-scale gas cars. With some minor machining and possibly some welding, the Conely V8 can be adapted to most 1/4-scale chassis. For more information, contact G.L. Conely Engines, Inc. 825 Duane St., Glen Ellyn, IL 60137. CC

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LEARNING THE BASICS

- 1) If I sat in a very small closet with my RACO Jac Rabbit running at full speed, would I die from carbon-monoxide poisoning?
- 2) How many calories are in a Trinity rear tire? I'm on a diet, you know.
- 3) My local hobby-shop dealer told me that the Grasshopper can leap tall buildings in a single bound and that it's faster than a speeding bullet. Is this true?
- 4) On page 150 of the December '90 issue, there's an ad for "Radioactive Hobbies." Are they exposed to radiation directly, or are they the waste products from nuclear meltdowns? Is it safe to play with these radioactive models?
- 5) If I wear a bulletproof vest while I run my Jac Rabbit and somebody shoots me, what are the chances that the bullet will be deflected off me and strike my Jac Rabbit, causing it to explode and send debris flying in all directions, killing a flock of sheep in New Zealand?
- 6) How do I start my RACO Jac Rabbit? Love always,

CHEBE MURUKACHONG
New York, NY

Chebe, despite what everyone else says, you're not an idiot. The only stupid question is an unasked one!

- 1) Running your Jac Rabbit at high speed in a closet is fine. Just make sure there isn't any gas in it.
- 2) The new, low-cal Trinity off-road rears have 2 calories, and the monster-truck rears have 6.
- 3) Always believe everything that anyone tells you, Chebe—especially if they're salespeople, because they're extremely honest individuals.
- 4) Neither. Radioactive Hobbies' products have tiny thermonuclear devices hidden in them that detonate when the product is used improperly. I suggest you get their entire product line and use everything simultaneously before reading the instructions.
- 5) For best results, discard the bullet-proof vest and hold the car to your chest

while you run away from the shooter. Then have him aim and fire at the car. That should solve all your problems, Chebe—and New Zealand's sheep will be safe.

6) Put gas in it.
We love you, too!!

CC

TAKE CONTROL, OR ELSE!

I've been in the R/C hobby for 2 years. After racing for a year, I bought a Custom Works Dominator and moved up to the fastest class. Moving up meant spending more money, which was fine—for a while—but then the costs became prohibitive. To be competitive, I had to buy better motors, batteries and support equipment. I was so deeply involved in racing that, instead of having fun, it became more and more like a chore. (When you become this disenchanted, it's time to get out or look for something else, which is what I did!)

I visited a local track (Archer's Lane and Raceway, Rte. 1, S. Attleboro, MA) where pan cars with stock motors and 6-cell batteries are raced indoors on a short, flat, concrete oval. I bought a Lazer Lite Shadow at a reduced price, and I've been racing it there for the past two months. It has been the most fun I've had in two years! Gone are the \$100 battery packs and the \$80 motors! The only expenses are tires, traction compound and entry fees, and people at the track are helpful.

Once, this was a relatively cheap hobby/sport; now, it's an expensive run for the trophy. People have started taking it too seriously and have driven the cost of having fun up too high. As a result, the hobby is dying out in this area. Although there will always be diehards (like me), there are fewer newcomers, hobby shops and tracks. Without new people, the hobby won't grow, and the thought of not being able to race anymore really bugs me. Sure, I could always run my Blackfoot around, but without the "thrill of victory and the agony of defeat," it just wouldn't be the same!

(Continued on page 23)

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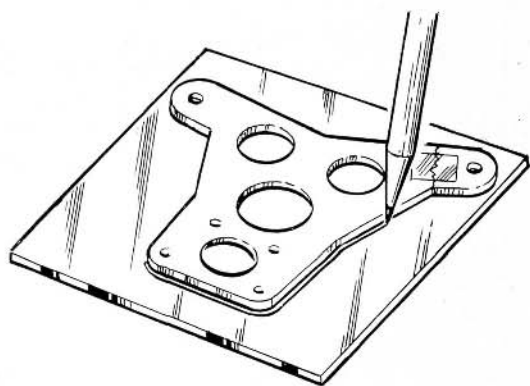


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PIT TIPS

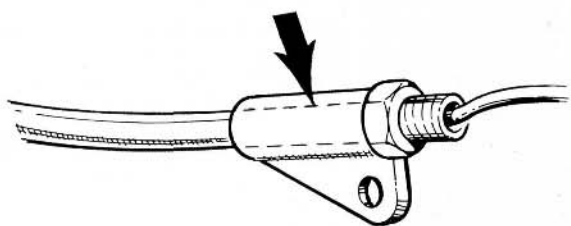
by JIM NEWMAN



MAKING NEW SHOCK MOUNTS

To make replacement shock mounts, this car owner taped broken parts together, set them on a piece of $\frac{1}{16}$ -inch-thick aluminum and then traced the outline. Presumably, he cut them out with a fine-blade hacksaw, drilled the necessary holes and filed their edges. You can find aluminum at hardware stores or hobby shops.

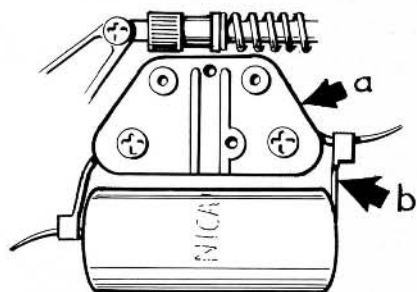
Eric Davis, Christiana, PA



FALCON ANTENNA RETAINER

This R/Cer devised a way to prevent the antenna tubing from falling off whenever he flips his Falcon. Using a drill bit with the same diameter as the antenna tube, he drilled through the antenna bracket. He pushed the tubing through the hole and, to hold the tubing in place, he screwed a nut of the appropriate size onto the bottom of it. Then he slipped the antenna wire through the tube.

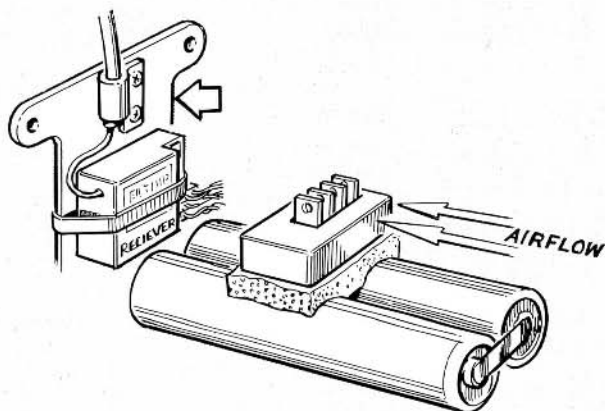
Dennis Ruppel, Elmont, NY



8-CELL PACK IN A BLACKFOOT

An 8-cell flat pack fits neatly in your car if you install one of the battery-compartment end brackets upside-down (a). To hold the pack in place, use Radio Shack nylon cable ties (b).

Steve Fallas, Los Altos, CA



RC-10 LENGTHWISE BATTERY

If you want to install a battery pack lengthwise, put a little piece of foam under the receiver, and attach the receiver to the shock mount with a rubber band. Set the electronic speed controller on top of the battery pack with a piece of foam between them for insulation. This setup also provides the ESC with a cooling airflow that passes through the Mosfet fins.

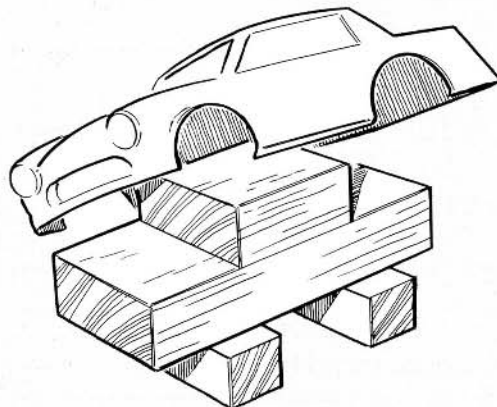
Jonathan Chu-Yang, Freemont, CA



TRACTION COMPOUND APPLICATOR

Here's a way to avoid the usual mess you make when you apply traction compound to your car's tires. Remove the spring from a Bingo marker, wash out the ink, and fill the marker with compound. Replace the sponge cap, and you have a clean, easy-to-use applicator.

T.J. Ahl, Austin, TX



DUMMY CARS FOR CRUSHING

When this R/Cer ran his Clod Buster over perfectly good cars, he sometimes scuffed or damaged them. To prevent this, he nailed some old car bodies to suitable wooden supports. Now he has fun without damaging his cars or his pocket!

Tom McGreevy, Mechanicville, NY

LETTERS

(Continued from page 21)

I'd like to encourage enthusiasts who have the hottest car setup, or who know something someone else doesn't, to share the information. It will be more fun to out-drive your competitors than to just blow them off the track. I think Trinity's new Equalizer motor is a great product, and I hope it will start a new trend. To the people at *Car Action*, thanks for the magazine and for listening. To the racers, good luck, and remember, it's only a hobby.

STEVEN R. SMITH
Lincoln, RI

Thanks, Steven! You're living proof that the way to deal with rising racing costs is to take the bull by the horns on a local level! I hope that others realize that they don't have to sit back and let things get out of control. Because hobby dealers and track owners are at the grassroots level, they're in a good position to handle such problems, too (instead of waiting for ROAR to do it)! They can devise rules that keep things fair and fun, and their businesses will thrive with customers who return because they have an equal shot at the races!

CC

MORE TRUCK TALK

I'm 15 years old and have been heavily into R/C cars and trucks for about 2 1/2 years. I've had three cars, including the one I have now. My first car was an FX-10 and then I got a Blackfoot. I was thumbing through the June '90 issue and came across the "Letters" (page 20). I read Robert G. O'Mea's response letter, and it convinced me that my Blackfoot was a piece of junk. I sold it through a hobby shop and bought a TRX-T Eagle, which I love. It runs well and is of great quality.

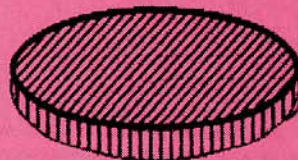
In the October '90 issue, I read Rob Pegler's letter, "Truck Trauma." Well, you said you wanted to hear from readers. I don't think it would be a problem to let the Blackfoot/Big Brute owners race in their own class. My track has a class for them, so why the heck are people rippin' on them?

MARK NOYES
Salem, OR

Because they're miserable snobs, Mark!
Glad you like your Eagle.

CC ■

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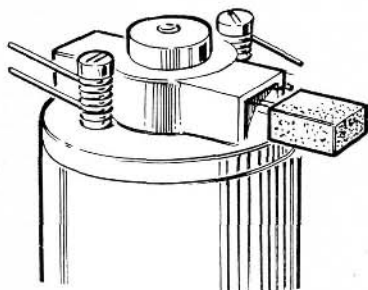
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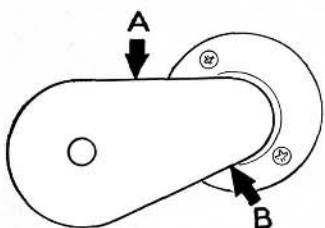
PIT TIPS



COMMUTATOR CLEANER

Take the brushes out of your motor, and replace them with small blocks of ink eraser that have been cut to fit in the brush holders (the springs will hold them in place). Spin the motor by hand and, when you remove the erasers, the commutator will be bright and shiny. Use compressed air to blow out any eraser crumbs.

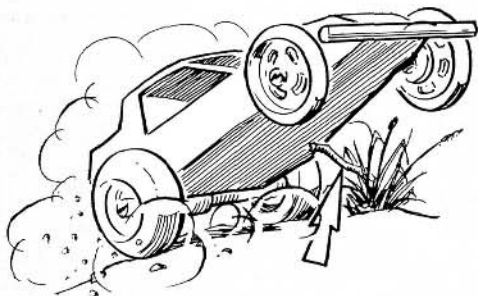
Tim Parrish, Miami, FL



RAPID BIG BEAR GEAR CLEANING

It usually takes about 45 minutes to disassemble a gearbox, clean and lubricate the gears and then reassemble it. This R/C'er found a way to do it in 30 seconds! Drill $\frac{1}{8}$ -inch-diameter (3mm) holes in the top and bottom of the cover (shown by the arrows). Blast canned air into the gearbox through the bottom hole (B), and spray oil into it. The accumulated dirt shoots out through top hole (A). Between cleanings, keep the holes covered with electrical tape. I strongly recommend, however, that you still open the gearbox and thoroughly clean and inspect it regularly. If you don't, it might cost you a race.

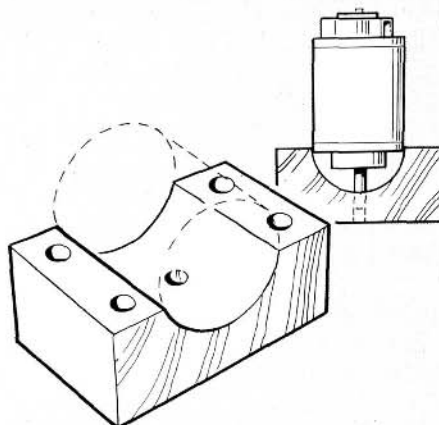
David S. Becker, APO, Germany



FAKING ACTION PHOTOS

Even if you don't own a camera with a high-speed shutter, you can still take action photos of your favorite car. Use a small twig to jack up the car, taking care to hide the twig in the shadow of a wheel or a tuft of grass. Have friend toss some dry dirt at the back of the car just before you press the button. This setup should help you create a convincing action shot. I did this with a full-size car once, and it worked beautifully.

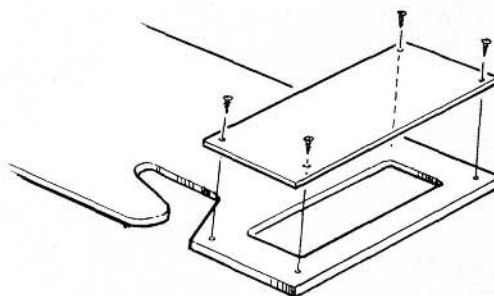
Jerry Zorns, Homewood, IL



MOTOR WORK JIG

Use a band saw to cut this useful, simple jig out of a piece of 2x4 lumber. Drill a hole in the base of the jig for the motor shaft. Then drill four holes through which you can thread those ever-useful Radio Shack nylon cable ties or rubber bands that will hold the motor in place.

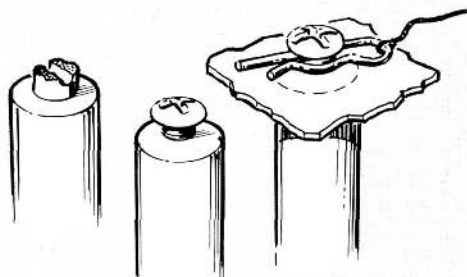
Chad Swagel, DePere, WI



ROAD WIZARD STONE GUARD

Cleaning out the pebbles that get between the endbell and the motor mount is a chore. To eliminate this problem, make a Lexan cover for the opening that's below the motor in the T-plate, then secure the cover with four small sheet-metal screws.

Chad Willrath, Celina, OH



BLACKFOOT BODY-MOUNT REPAIR

When his truck's body-clip lugs broke, this owner effected a neat repair. He filed the tops of the posts flat and drilled central holes into which he screwed 3x12mm screws. Now the body clips are neatly held under the screw heads. (Note the piece of cord that prevents the clips from being lost if they fall off.)

Tom Wasut, Minneapolis, MN

TRUCK of the YEAR

by STEVE POND



EACH YEAR, FOR THE PAST FEW YEARS, the editors of *Car Action* have butted heads when trying to choose the "Car of the Year." There are no established criteria; we just make an overall appraisal of the impact we think each car has on the market. As you might imagine, the discussions are often heated, each of us arguing the virtues of his candidate. Despite our differing opinions, we've always managed

to come out of the huddle with a definite winner. Until this year, we've only judged cars, but there's such a variety of popular vehicles out there that we thought we should expand the scope of our annual picks, so here's our "Truck of the Year."



S u r p r i s e , s u r p r i s e — L o



The Team Losi* JR-XT (our 1991 choice), is not only a pioneer, but it's also a stout performer and the most versatile racing truck available. Based on the chassis of the popular JR-X2 2WD off-road racer (our 1990 "Car of the Year"),

the JR-XT will accept almost all the accessories developed for the car as well

as those developed exclusively for its use.

The accessories from Team Losi and after-market manufacturers include myriad suspension arms, braces, gears, slipper clutches, tires and wheels, transmission and chassis components—all designed to improve what's considered to be the truck that handles better than any other. This

availability of parts makes the

JR-XT even more

attractive to potential truck racers; there's a good supply of parts to replace any you break.

d o e s i t a g a i n !



TRUCK OF THE YEAR



A "TRICK" TRUCK

The truck has a very thick, rigid, graphite chassis plate that allows the suspension—not the chassis—to soak up the bumps. At each end of the chassis are unique suspension assemblies that contribute to this truck's great performance.

The front suspension comprises the standard lower A-arm assemblies with turnbuckles and adjustable upper links. The arms are molded of a composite plastic that's strong enough to withstand a heavy blow. Damping the front end are Losi's own oil-filled coil-overs, which are extra long to provide as much suspension travel as possible.

The rear suspension for the JR-XT was introduced with the JR-X2, and it's still considered to be unusual. The five-link assembly, which is standard with every JR-XT, is second to none when it comes to gaining traction on slippery surfaces. It also effectively prevents "squat" when the truck is accelerating, and this makes its performance more predictable.

The JR-XT's transmission (also derived from the JR-X2) is also a superior design. Its internal differential is in the center of the transmission, so it's easier to adjust than most standard internal diffs. Just remove the rubber cap from the tranny case (other trans-

missions require the removal of a dog-bone). The output gears to the drive shafts, and the gear at the center of the differential are made of a strong, light plastic that keeps rotating mass to a minimum for super-strong acceleration.

TERRIFIC TIRES & WILD WHEELS!

To complete the package, Losi even developed its own line of tires and wheels—ones that are now regarded as some of the best ground-holders in the business of racing trucks. The "Naturals," as they're called, are of molded natural rubber that offers durability and great traction. The JR-XT includes a pair of spiked Naturals on its rear and ribbed ones for the front.

The wheels aren't a new idea, but they're certainly welcome to racers on a budget. Three-piece wheels have generally fallen into disfavor because of their weight, but they've been resurrected on the JR-XT, and most reports have been favorable. To minimize weight, the wheels are designed to use as little material as possible, but it's used well in critical areas, so the wheels are strong. When assembled, these light wheels lock the tires into place, and they can be re-used when the tires wear out.

Finally, the JR-XT is covered by Losi's own Toyota stadium-truck body. It isn't the most detailed of truck bodies, but it's molded extremely well and can really take a beating.

The package assembled by the Losi crew is undoubtedly the best that's available. This isn't to say that the truck is without competitors; there are plenty of trucks on its tail,



The JR-XT's longer front shocks and long A-arms increase the suspension travel to handle even the most abusive off-road tracks. The ingenious front bumper/body mount not only protects the car, but it can also be adapted to bodies of various heights.

but in racing, keeping them in the rearview mirror is what it's all about. The JR-XT is certainly capable of accomplishing that—and more! The basic package is simple enough for most attentive builders to breeze through its assembly, yet its design knows no limits when it comes to all-out competition.

Congratulations to Gil Losi and the team for creating such a fabulous truck, and for being awarded our first "Truck of the Year" honors!

**Here's the address of the company featured in this article: Team Losi, 13848 Magnolia Ave., Chino, CA 91710.*

Left above: ■ Losi's unique five-link rear end is the perfect solution for rough tracks. Designed for the JR-X2, this suspension has proven its reliability in many national races.

Above: ■ The JR-XT's bellcrank steering system is another innovative feature. You won't need an after-market servo-saver, because it's incorporated into the bellcrank.

TROUBLESHOOTING

by STEVE POND

Illustrations by JIM NEWMAN

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



CHASSIS CHANGES NEEDED?

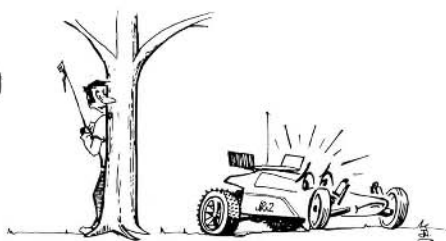
I just bought a new Traxxas Hawk race truck. I think it's a pretty good deal, and there are a lot of available hop-up parts, but I have a few questions. Will a Futaba receiver crystal hang over the edge of the battery case like the Traxxas receiver does on the Radicator? Is there any way to modify the chassis to prevent the turnbuckles from hitting the edges of the openings through which they pass, or will I have to do something with the suspension?

Jesse Nelson
Hibbing, MN

The position of the crystal in the chassis depends on where and how you mount your receiver, and that depends on which radio system you use. On Traxxas receivers, the crystal seems to protrude out of the case more than it does with most other systems. If you use a Traxxas receiver, just be aware that the crystal is close to the battery compartment, and take precautions when you install or remove the battery. On other receivers, the crystal will probably be in a different position, or it will, at least, be recessed farther into the casing.

Your steering-linkage problem might

be the result of improper installation. The turnbuckles should be mounted on the bottom of the steering blocks. If the rods are mounted on the top of the steering blocks, when the suspension is fully compressed, they'll hit the top of the openings they pass through. If properly mounted, the steering rods won't ever come in contact with the openings in the chassis.



DON'T INTERFERE!

Into my JR-X2, I put a Tekin speed controller, a Twister 17-turn Pocket Rocket and a Futaba Sport radio, which I previously had in an RC10. When I run my car 15 yards away from me, it starts to act on its own. I have to get closer to it and then drive it. How can I solve this problem?

Jamie Karberg
Flagstaff, AZ

Your receiver is obviously having trouble accepting the signal from your transmitter. Your radio might be out of tune; if it is, you'll have to return it to Futaba for tuning. In my experience, Futaba radios are very good, so before you send it back, make sure you've done nothing to cause the problem.

Some R/Cers cut the receiver wire to fit the antenna; this is a mistake, and it will cripple the radio. To operate properly, the antenna must be a certain length, so if you've cut yours, it must be replaced with wire of the correct length. Send the receiver back to Futaba for this repair.

If this isn't the problem, check that the receiver and antenna have been properly installed. The antenna should be fed cleanly through the antenna tube, with the excess wire wrapped around an antenna loom or around the tip of the antenna tube; the wire shouldn't wrap around

itself. Make sure that no part of the wire touches the graphite chassis. The receiver should be mounted as far as possible from the electrical components. I know this is difficult to do, but mounting it on the chassis plate or the shock tower is certainly better than mounting it on top of the transmission over the motor.

The motor can also cause problems. If the brushes are very worn and the commutator is in very bad shape, you might have excessive arcing, which will interfere with radio operation.

There's a remote possibility that the voltage being supplied to the receiver from the speed controller isn't sufficient, but I've never run into this problem. Ask someone who has had experience with radio installations to inspect your car. If everything checks out and the radio still gives trouble, send it back for a tune-up.



GET YOUR BEARINGS...

I've searched for ball bearings to fit my Tamiya Vanquish. Do you know where I can get them, or should I buy DuraTrax 5x11mm bearings? Don't the Avante and the Egress need the same bearings? Why doesn't anyone make them?

Stefan Holuf
Bemidji, MN

In most hobby shops in my area, 5x11mm

bearings are the most popular item! They're a common size and will fit most cars and trucks in Tamiya's line. They're available from Tamiya and at least a dozen other ball-bearing suppliers. Ask your hobby shop to order some for you, if they don't already have them in stock. If they can't do this, you can always get them by mail order (look at the ads in this issue).



TRUCK TRIBULATIONS

I have two JR-X2s, and I wanted to convert one into a truck, so I did, and I modified it. I run a Trinity Triad Series, 13-turn, modified motor and a Trinity Monster Horsepower 7-cell SCE pack. There's only one problem: my plastic center differential gear kept burning up. I had to buy Thorp's Dirt-Burners hard-anodized, JR-X2, aluminum diff gears. I've had no problems since I started using them. I'm just confused, because the JR-XT doesn't burn up its center diff gear, and it's the same diff as in the JR-X2. Why doesn't it burn up in the JR-XT?

**Kurt Perko
Pueblo, CO**

Melting of the diff gears seems to be a problem with some Losi cars and trucks, but in every case, it's caused by improper adjustment. The JR-XT's larger, heavier tires require a higher gear ratio, and this makes diff adjustment even more critical. If the diff is too loose, the diff rings grind against the diff balls. This not only leads to the development of flat spots on the diff balls (which ruins smooth operation), but it also generates tremendous heat (just try grinding metal against metal,

and you'll see what I mean!). The plastic diff gears can't dissipate the heat, so heat increases and melts the gear. By using aluminum gears, you'll avoid this problem, but you're "throwing water on a grease fire."

Plastic gear is used to keep rotating mass to a minimum. The lower its rotating mass, the faster a car will accelerate. By replacing the plastic gear with a heavier aluminum one, you've solved one problem but created two others. You've lost the advantage of having light transmission components, and your diff still isn't properly adjusted!

For the best results, tighten the diff gradually (a little at a time) until you can accelerate at full throttle without the differential slipping. If you run on a high-bite track and need the slipping to make your car or truck more controllable, think about buying a slipper clutch (see the article in this issue). A slipper allows for more control with a high-power motor while maintaining the correct diff adjust-



A LOAD OF PROBLEMS!

I recently bought a pair of Imex Olympic Tread tires for my King Cab. Ever since I put them on my wheels, my truck has given me loads of problems. The rear suspension shakes when I run the truck. At one hobby shop, they said, "Your wheels could be your problem. How about buying these Sees aluminum wheels?" Sure, the wheels work fine with another pair of tires, but they don't work with the Imex ones. Of course, if I buy \$60 wheels,

(Continued on page 34)

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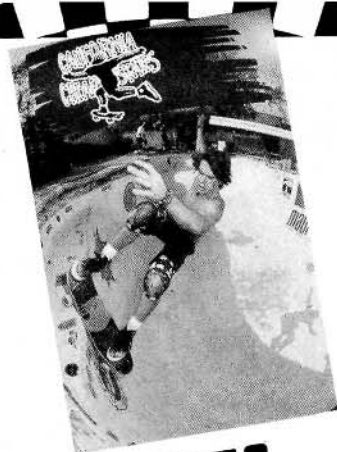
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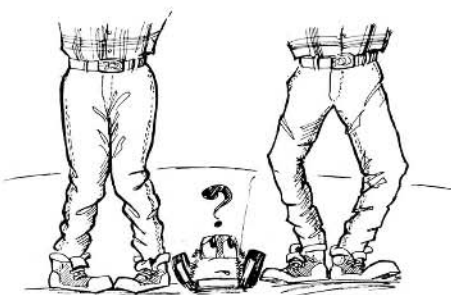
TROUBLESHOOTING

everything will be OK! At another hobby shop, they said, "You need a new truck; why not try a Clod Buster? It's really rigid..." No! As you can see, I'm having mucho problems. I'm totally clueless about how to balance tires, especially when they're a little worn. Please, *Car Action*, you're my last hope!

Tommy Amit
West Long Branch, NJ

The King Cab's stock rims are molded extremely well, so it's highly unlikely that they're "out of round"—unless you've hit something very hard. The problem could be inconsistent tire molding, which would throw off the balance, or there could be dirt trapped inside the tires. Trapped dirt tends to collect in one spot, and when the tires rotate, the weight of the dirt will cause the shaking you've described.

If the problem is caused by trapped dirt, punch a 1/8-inch hole in the tread of each tire so that the dirt can run out. If the tires are clean and mounted properly on the rims, there's a chance that they were poorly molded, so return them to the manufacturer.



YOU PUT YOUR LEFT TOES IN... YOUR LEFT TOES OUT...!

Does any company make universal-joint drive shafts for the RC10 or the Ultima? If so, is the price reasonable? My brother owns an RC10 with an Airtronics radio, which has a 94102 steering servo, and I've experimented with toe-in, toe-out, positive and negative camber, spring setting, tightening and loosening the diff. I just can't seem to make the car steer any more tightly. Is a direct drive a good idea for my Ultima? I race on a medium hard-packed dirt oval with a Triad 10-turn motor.

Andrew Bloomfield
Bunker Hill, WV

Team Associated makes a U-joint dog-bone for the RC10. It has a standard dogbone end on the transmission side and a U-joint toward the wheels. Kyosho also

offers a similar option for Ultima cars. Telescopic universal-joint drive shafts are available from Custom Scale Components (CSC), 1807 South Washington, Suite 363, Naperville, IL 60565, and from Raborn Racing Originals, 6707 Chimney Rock, Belaire, TX 77401.

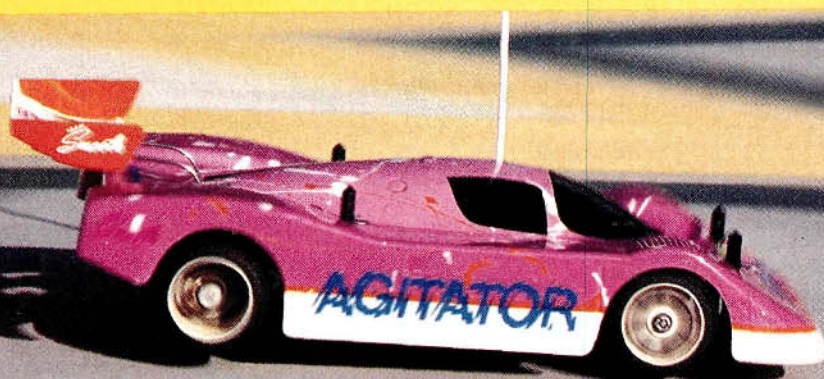
As for your RC10's handling, you must start with the shock oil. Experiment with oils of different viscosities to find the optimum combination for the front and rear damping. If the tires don't stay on the ground, there's very little you can do to the suspension to improve handling. For the RC10, a good starting point is 30WT oil in the front shocks, and 10 or 20WT oil in the rear shocks.

Front toe adjustment should be kept fairly neutral; to improve steering, the rear should have very little toe-in (if your car is equipped with hardware that allows you to adjust only the rear toe). On a slippery track, keeping the rear end glued to the ground is often a problem, and rear toe-in is often helpful, but it reduces steering response. Proper camber adjustment is also helpful, but if you aren't more than 2 or 3 degrees away from 0, the cause of your problem probably lies elsewhere.

Correct spring settings can help you get your car through turns, but the key is to make small, precise adjustments. To increase steering response, loosen the front springs or tighten the rear ones.

Direct drive works very well on dirt ovals, and if your track allows it, I recommend it (if you want to spend the money). With a 10-turn motor, be particularly careful to ensure that you can obtain the proper gear ratio with a direct-drive transmission. When you use such a powerful motor on a short track, the gear ratio will be much higher than usual. Direct-drive transmissions have a much more limited number of ratios than standard transmissions. ■





by JIM DAHL

ADVANCE RACING TECHNOLOGIES

agitator

XII

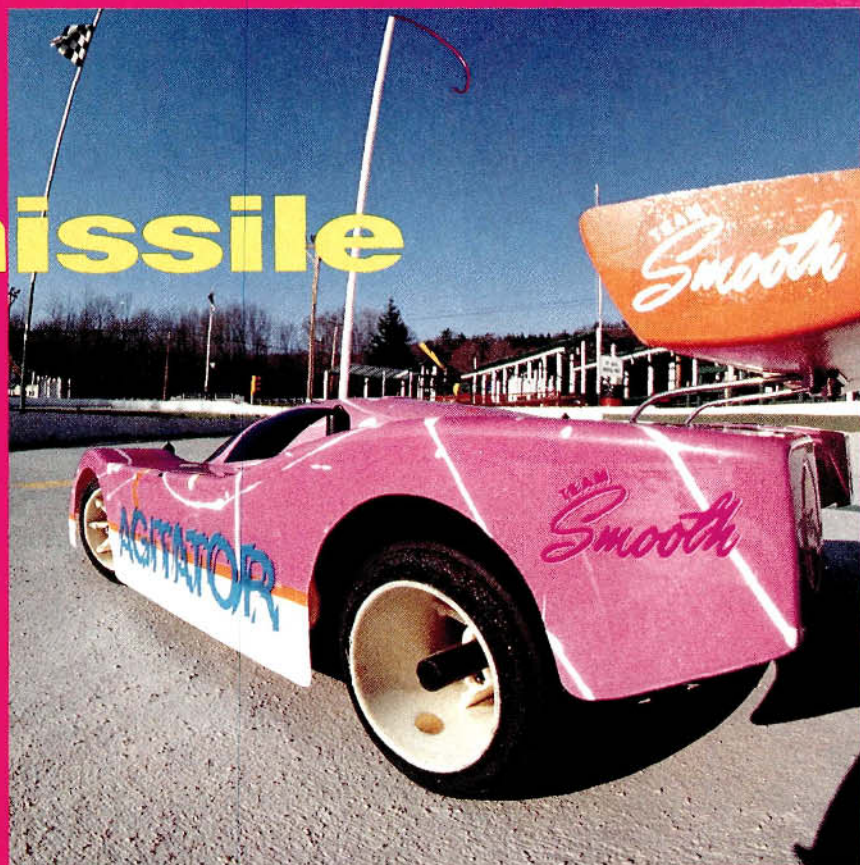
ALTHOUGH THERE are more 1/10-scale cars and more places to race them, 1/12 scale still has a very strong following. For years, several companies have produced pan cars in this scale, and a few new ones will soon be available. Advanced Racing Technologies' Agitator XII, which is fairly new and designed for competition, has had notable successes in the past year.

mini missile

THE KIT

The Agitator XII comes in a small box that contains an instruction manual, a parts list and numbered poly bags that contain all the necessary parts and hardware.

Several of the molded parts are familiar pan-car fare, e.g., the steering blocks and the rear ride-height cams. All the major chassis parts are machined of .093-inch black-graphite sheet, but some of the smaller sheet parts (including the T-plate assembly) are made of flexible, .093-inch black fiberglass. Most of the dyed-black, molded-nylon parts are unique to the Agitator XII. Both rear pod bulkheads are of machined aluminum, and the rear axle is of



PHOTOS BY STEVE POND

agitator XII

graphite with left- and right-side Delrin hubs.

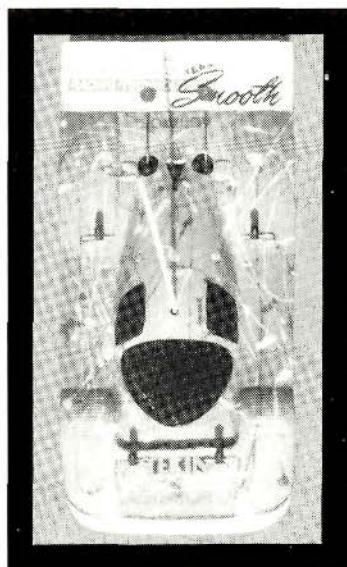
Sturdy body posts are provided for Can-Am-height bodies, but you'll need longer ones if you want to run a NASCAR sedan. Any 1/12-scale body will fit, but there are no wing mounts for those who want to add a rear wing.

ASSEMBLY

If you've had experience with pan-car assembly, the Agitator's manual should be adequate, but if you're used to manuals that have many steps and illustrations, you may find this one difficult to use. But what it lacks in the first 12 pages on assembly, it makes up for in the last six pages on set-up secrets. Before you start, read all the instructions and become familiar with *all* the photos. The information in each step doesn't always refer to the adjacent pictures.

The usual assembly "do's and don'ts" apply to the Agitator, especially since it's a racer. Some parts will need fitting, and some steps will require a trial-and-error approach. Glue the graphite edges with CA, and sand the edges where the battery strapping tape goes over them. Except where locknuts are used, use threadlocking compound on all metal-to-metal threaded fastenings.

I had some problems with the assembly and the initial testing. At the front, the upper A-arms required a lot of trimming to clear full-width wheels, and so did the rod ends that are attached to the steering blocks. I eventually replaced the rod ends with small nylon Heim joints. When assembled, the Agitator XII has a strong, rigid front end with a simple



caster adjustment, and its kingpin springs can be changed easily. Camber, however, can only be changed by bending the axles, and there's no way to change the front ride height. I made plastic spacers of several thicknesses, and I inserted them between the chassis and the block assemblies.

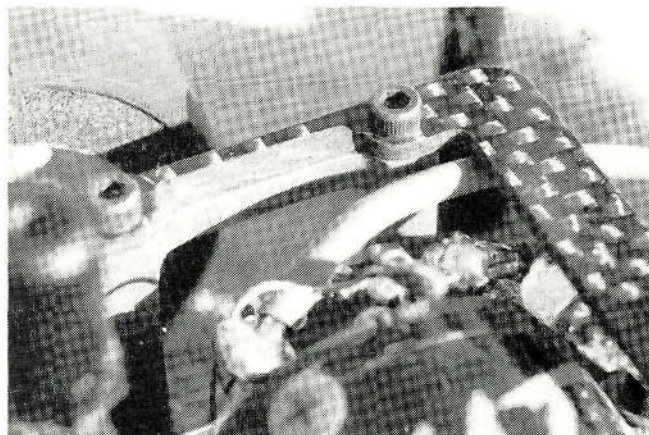
I also had problems with the rear axle. The inner right hub is made of Delrin, and it's held on the axle with setscrews. This hub wasn't

rings that were larger than the standard ones. The right hub is spool-shaped, and to prevent the right rear wheel from spinning, it has two Allen setscrews.

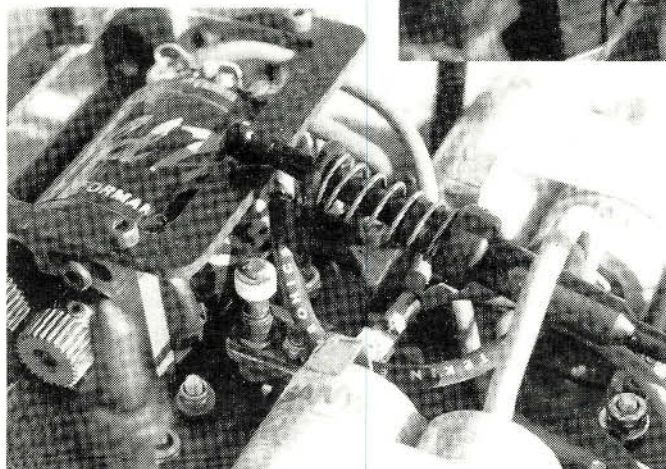
Instead of having the usual thrust bearings in the diff-adjustment assembly, the Agitator has small, thin spacers that keep the hubs away from the axle bearings' outer race. Because the load would be transferred to the inner race where it could punch out the bearings' center, I replaced the tiny spacers with thrust bearings.

The bottom plate is much shorter than usual, so the rear

Even the rough spots weren't a problem, and its lap times were very good—especially taking into account that it runs on only 4 cells.



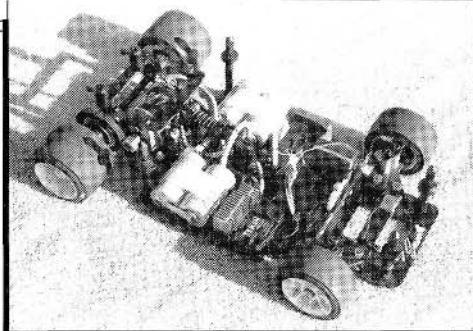
Above: Here you can see where the rear pod was modified to facilitate motor removal.



Left: The rear damper uses thick silicone as a "resisting medium." The shock works well, but requires regular maintenance to keep its action consistent. The Peak Performance Wild Thing motor performed well with the Team Smooth 4-cell matched SCEs.

strong enough to withstand a few encounters with the boards, so I bought an after-market axle and an aluminum left hub, which worked fine. The original axle had diff

pod opening through which you install the motor is in the top plate only. The space between the aluminum bulkheads is almost .25 inch less than that on most cars

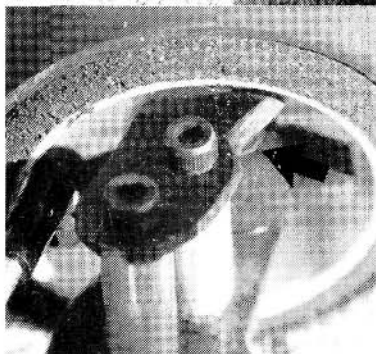


and, even with the pinion removed, I had to grind the top inside the left bulkhead so that the motor would fit. Also, the axle cams fit very tightly in the bulkheads and on the bearings (probably because they had been

disassembled, reassembled and refilled after every run (one battery pack). As with all grease-based rear damping systems, smooth operation is essential to good, consistent handling.



Above: It would have been tough to stuff a 6-cell pack into this car. The Tekin 411P will handle any motor.



Left: See how close the tire is to the suspension components? Material had to be removed from the upper kingpin support so that it would clear the front wheels (see arrow).

boiled and dyed), and they required sanding.

After it had been assembled, the rear pod proved to be excellent and had a wide range of adjustment. Because of the flexible attachment between the T-bar and the rear pod, Advanced recommends that you always install a wing.

Even though it isn't easy to remove or install the damper, it must be kept clean and should be

RADIO

The installation of the radio gear was straightforward, but there was little room for it in this 1/12-scale car. Tekin's* micro-receiver and its fabulous, small, 411P ESC made the job easier, but I'm glad I was setting up the car for a Team Smooth* 4-cell saddle pack and not for 6 cells. As usual, keep all the wires as short as possible,

(Continued on page 78)

ADVANCED RACING TECHNOLOGIES AGITATOR XII

Type On-road
Scale 1/12
Sug. Retail Price \$240

DIMENSIONS:

Overall Length 13.5 inches
Width 6.75 inches
Wheelbase 7.56 or 7.8 inches
Front Track 5.40 inches
Rear Track 5.25 inches

WEIGHT:

(with 4-cell battery) 27.6 ounces

BODY: (not included)

Type On-road

CHASSIS:

Type Pan
Material Graphite

DRIVE TRAIN:

Primary Pinion/spur
Transmission Direct-drive
Differential Ball
Bearings Ball bearings

SUSPENSION:

Front Type: Block with spring
Rear Type: Single arm with cone nuts
Damping Front None
Damping Rear Grease-filled, coil-over damper

WHEELS: (not included)

Front & Rear:
Type Standard 1/12 scale

TIRES: (not included)

Front & Rear Standard 1/12 Scale

ELECTRICS: (not included)

Motor 540 size
Battery Sub-C saddle packs
Speed Controller Electronic

OPTIONS AS TESTED:

Andy's Sauber Mercedes body, Tekin 411P ESC, Futaba Magnum Junior with 132s servo, Tekin Micro-receiver, Peak Performance Wild Thing 14-turn double motor, Team Smooth 4-cell 1700 SCE batteries, Robinson Gold Titanium pinion gear, Trinity spur gear, TRC Gold capped tires and Kimbrough servo saver.

COMMENTS:

Although it wasn't easy to assemble, and some of the parts had to be replaced, the car is sophisticated, sturdy, has a wide range of adjustments and performs very well.

Here's the best shot we could get of Rodger Curtis with the Stealth car at last year's World Championship in Australia. Except for the transmission, the car remains shrouded in secrecy!



composite gear. Next, insert a small ball bearing into the center of the gear (making this a "pro"-style diff) and another bearing into one of the side plates.

To assemble the differential, you put a bolt (one with a thrust-washer assembly attached to it) through one diff half. Screw this assembly into a nylon nut that has two "ears" (to key it into the outdrive) and a tension spring that you've inserted through the other diff half. Tighten the bolt until the ears of the nut reach the bottom of the slot in the outdrive, and then back it out about a quarter of a turn.

GEARS

Although there are many popular ways to transfer power (belt, chain, etc.), I prefer gears, and the gears in this tranny are precise. The diff gear and the counter gear are of a black composite material that doesn't need lubrication, and the steel top gear is permanently attached to the slipper shaft. The Stealth's internal gear ratio is 2.25:1—perfect for both trucks and cars!

THE CASE

The tranny case was the first thing that caught my eye

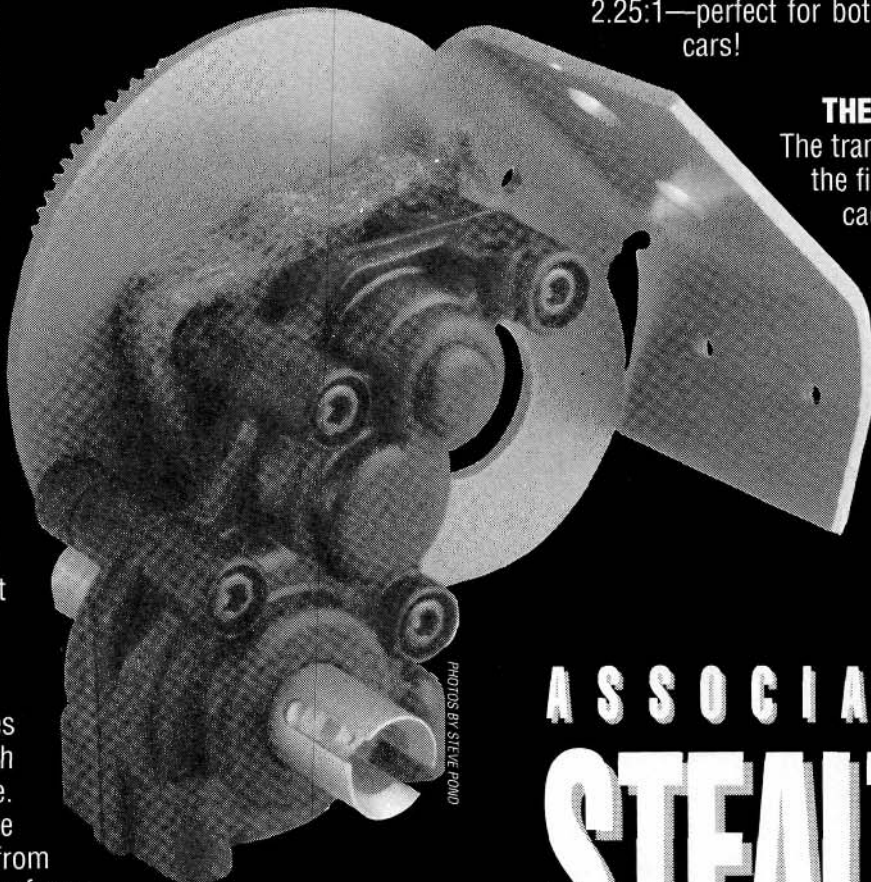
ASSOCIATED'S
SECRET IS
out!

THE PEOPLE AT Associated* wanted to design a tranny with a low rotating mass that would also be strong and dependable, and they succeeded! The new Stealth transmission is one of the hottest RC10 performance add-ons available. Its design is so advanced that it's simple! It's easy to assemble, and it doesn't require a lot of maintenance.

THE DIFF

On the MIP* tranny, the outdrives are mounted on the drive plates with setscrews, which often come loose. On the Stealth, however, the drive plates and outdrives are machined from a single piece of steel. The inner surfaces of the diff halves are machined so that they press more firmly against the diff rings, and this reduces the possibility of misalignment and prevents slippage.

To assemble the diff, lubricate the 12 tungsten-carbide balls with Stealth Diff Lube and insert them into the very strong



PHOTOS BY STEVE POND

ASSOCIATED STEALTH TRANSMISSION

by JOHN HUBER

ASSOCIATED STEALTH

(it was so small that I could hardly believe that all the gears fit inside it!). To support the gears, six precision ball bearings (including two large Teflon-sealed ones that support the differential) snap into the sides of the case.

You can build this tranny in two ways. Holes for the

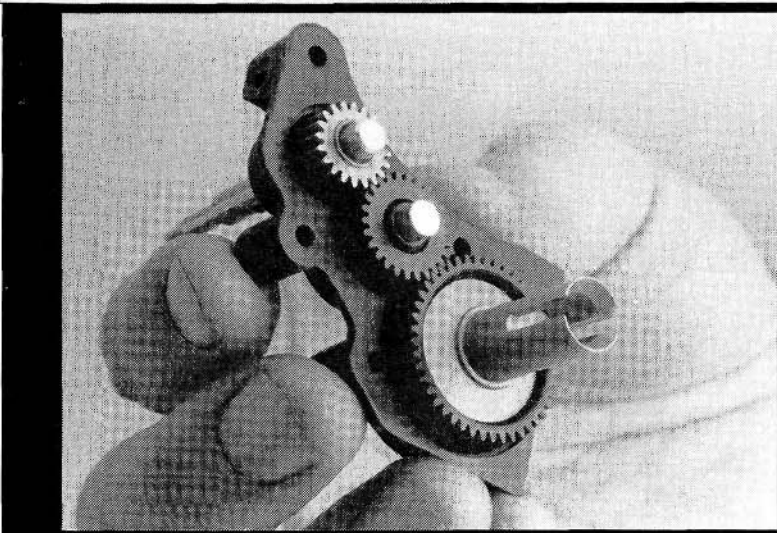
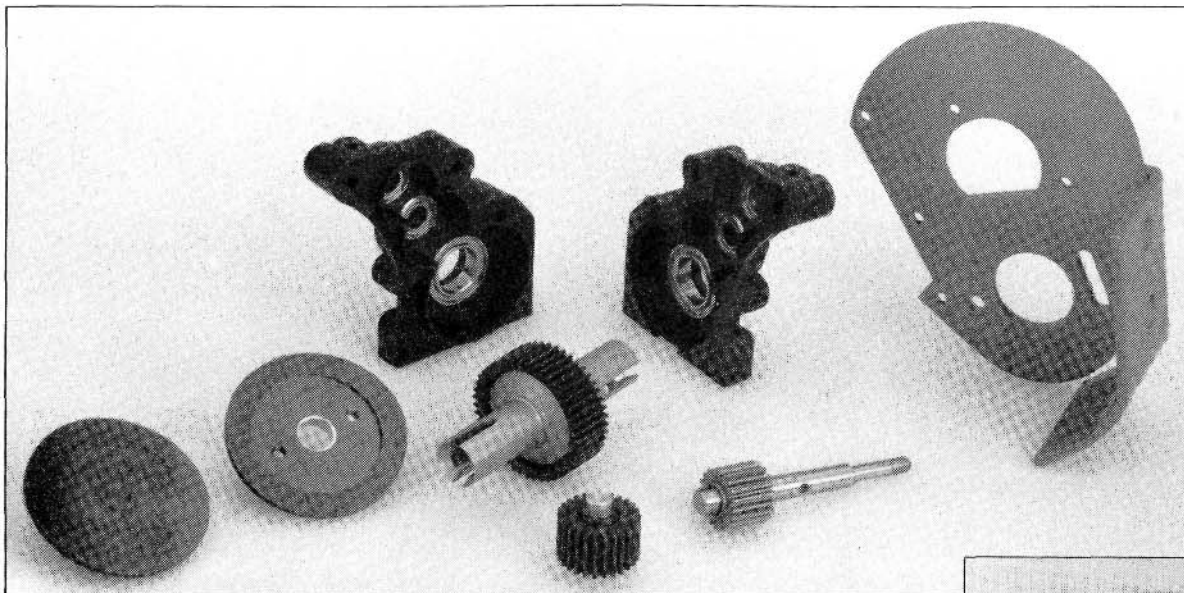
slipper shaft are drilled in both halves of the case, and the kit includes a small nylon plug to seal the hole in either the right or left half, depending on the configuration you choose. For a standard setup, install the plug in the left half; for mid-motor or Hyperdrive* setups, install it in the

right half. There's hardly any clearance inside the case, but all the gears fit perfectly and turn freely when you join the case halves.

The motor plate has an extra hole in it to accommodate an additional bolt that's used to mount it to the tranny. This extra bolt ensures that the case is clamped tightly all the way around.

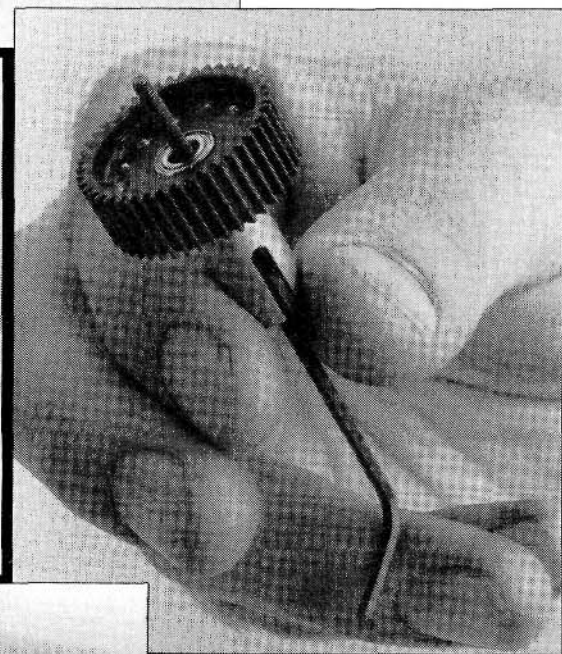
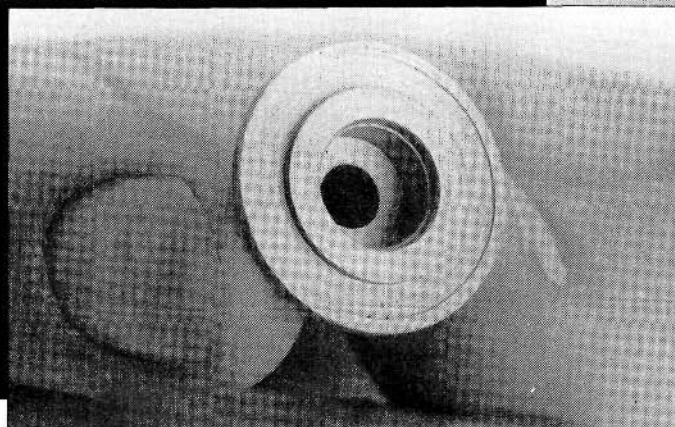
ASSOCIATED TORQUE CONTROL

The Stealth kit also in-

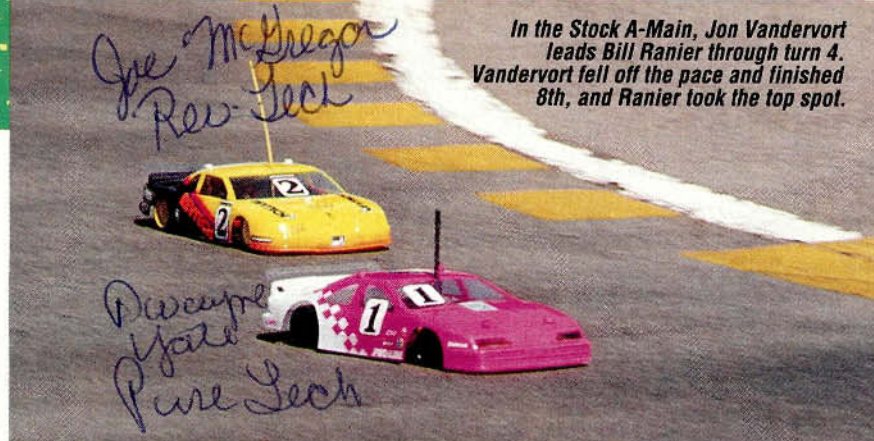


Above: the case is molded accurately, and its halves fit together tightly to keep out dirt. There's not much surplus space inside this case!

Top: the kit supplies everything you need, including the motor plate and the gear cover. Notice the large Teflon-sealed outdrive bearings.



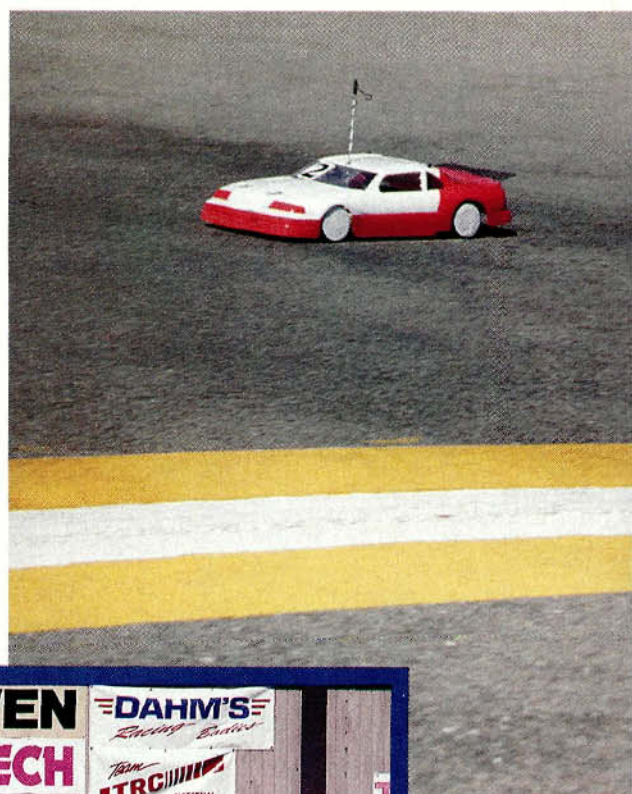
Above: the diff side plates and outdrives are machined from a single piece of steel. To reduce the contact area between the diff ring and the diff half, a portion of the half is slightly raised to prevent the ring from slipping. Left: the carbide diff balls and the central diff bearing make this diff extremely smooth. It's the best I've ever seen!



Martin Buchanan kept the show rolling with his great work on the PA system.

PAVED nats OVAL NORRCA

by JIM SHEPKA



"To the victor go the spoils." HPI and Twinn-K provided the hardware.

FOLLOWING THE UNFORTUNATE closing of the El Cajon R/C Speedway, the 1990 NORRCA Oval Nationals were moved to Racer's Haven in Bakersfield, CA. This fine multipurpose facility, with its ultra-wide track, is well-suited to extremely fast competitive racing.

When I arrived on Thursday for a look at the track, local

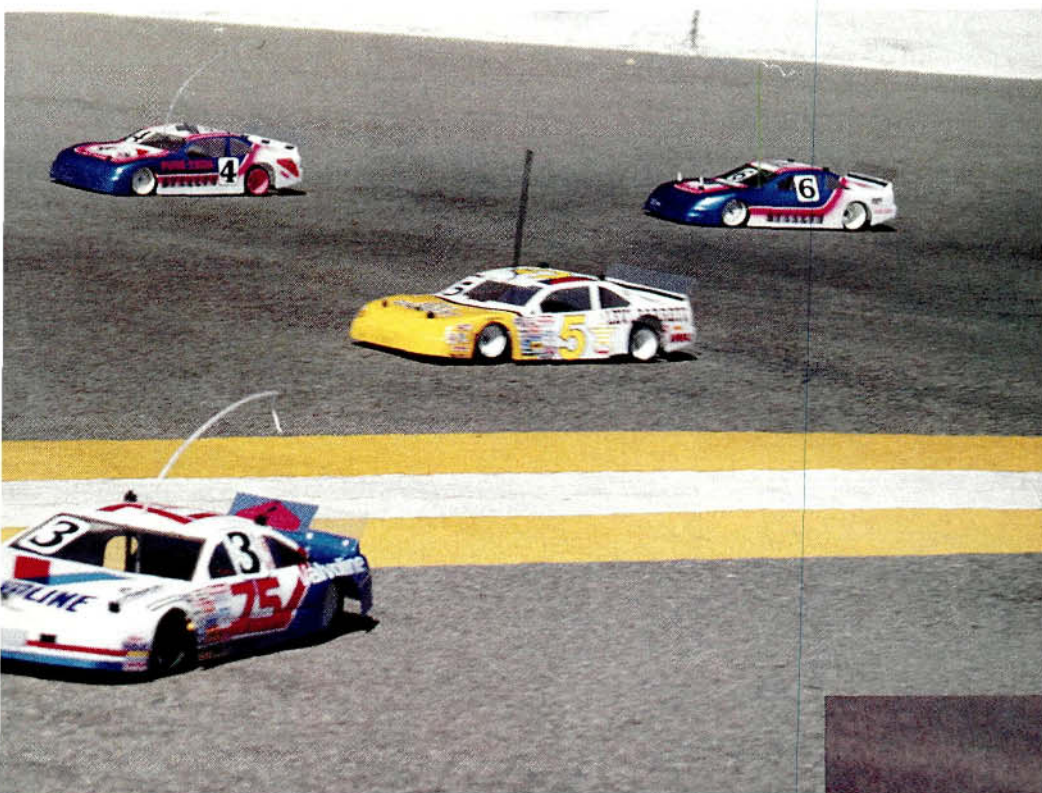
weather forecasts were predicting temperatures in the low 80s, but we hit triple digits in the shade! Tires were destroyed by the incredibly hot track temperatures and the VHT that was applied to it before practice began. Foam tires failed, and caps were of little use, so it was a profitable weekend for tire manufacturers.

Since NORRCA rules specify the use of full bodies

(no rear cutouts) and forbid wings (spoilers up to 2 1/2 inches can be used), the cars looked realistic, and chassis tuning was at a premium. It was soon evident that local drivers had their rides dialed-in right from the word go.

QUALIFYING

Two rounds of qualifying were scheduled for noon on Friday, and the remaining three for 9 a.m. on Saturday. Despite the heat, many drivers were near the track record. In the Stock Class, seven turned 31 laps, and were separated by only a few seconds.



burnout

Bob Novak takes a short cut to the A-Main with some aggressive driving. Note the absence of wings; NORRCA rules allow only spoilers.

Bakersfield

Craig Hamilton came out of the pack early and nearly broke the 32-lap barrier with a fine effort in 4:00.54.

Gary Demory led a handful of Open drivers into 35-lap territory. His time of 4:03.30 enabled him to edge out Chip Reisbol (4:05.39) and Gary Hamilton (4:05.57) for the top spot. The nearly 20-foot-wide track had plenty of room for passing, and this made for some very competitive (but friendly!) qualifying. Drivers lost very little time when they had to get out of the racing line to allow faster cars to pass, and very little paint was swapped during the weekend.

As the temperature continued to climb, I doubted that the times would get any faster, but my doubts lasted only four minutes! Three Stock drivers managed to crack lap 32 in their second pass: Jon Vandervort (4:05.21), Craig Hamilton (4:08.00) and Steve Lantz (4:08.26).



PHOTOS BY JIM SHEPHERD



Doug Warneke took top honors with his beautifully detailed Pontiac.



In the Open Class, Chip Reisbol kept his TQ hopes alive with an even faster effort of 35/4:05.04. Frank Killam, Cliff Lett, Joe MacGregor and Steve Allen also did the trick (separated by a couple of car lengths). Two rounds of qualifying (16 heats in each) were completed in a little more than 4 hours, and there was plenty of daylight left for practice—hours that many drivers took advantage of.

Saturday morning brought an early wake-up call for concours judging, which was scheduled to take place before the third round of qualifying. Judging is always difficult at a national event, and the judges did a great job of choosing the best of the best. Top honors went to Doug Warneke with his beautifully prepared Sunoco racer, which had a highly detailed interior. Mark Anderson took the runner-up spot with his Miller Racing Special. The final spot went to local favorite Mike Garrett's Revtech-clad racer, and Mike also disproved the "all show, no go" theory by placing 6th in the Open B-Main!

Now we're talking major motion! With a couple of runs under their belts and some extra stick time, these guys were getting serious.



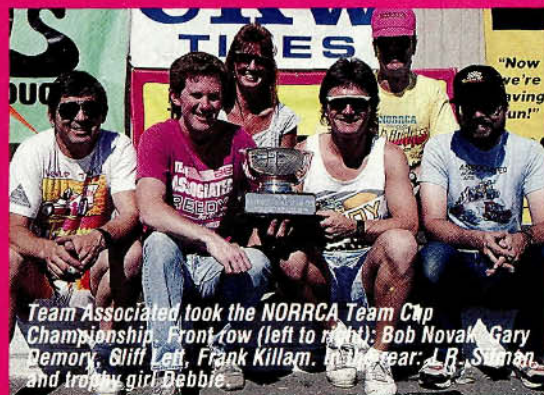
The temperature was slightly lower, times were up, and the competition was intense. Seven of the top 10 drivers improved on their first time, and a number turned in solid, 32-lap runs. In the fourth round, Jon Vandervort's great driving took home the

Stock TQ honors, and his time of 32/4:01.58 gave him more than a 2-second advantage over Bill Ranier. For the last spot in the A-Main, Kyle Ioffrida nosed out Ed Allen with a run that was just a tick faster than his last qualifier.

Chip Reisbol continued to dominate the rest of the Open field with a blistering 36/4:04.45 in the third round. Even though he was the only driver who went 36 laps, any one of



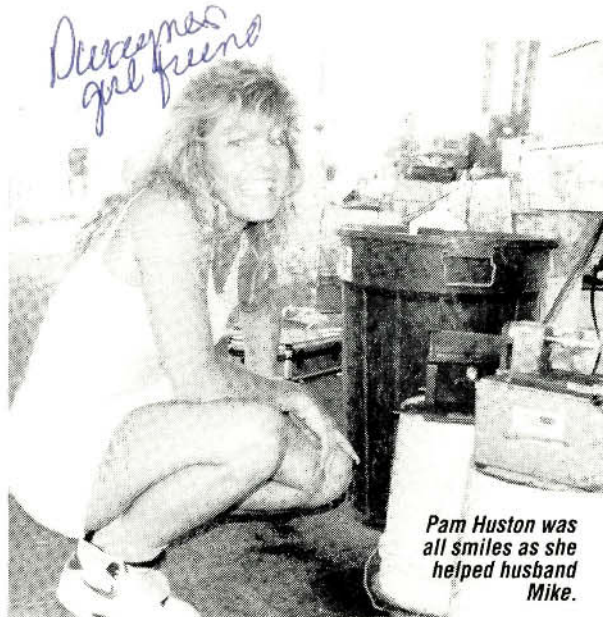
Bob Novak trues his tires before the Mains. Struck by mechanical gremlins, he was the first out.



Team Associated took the NORRCA Team Cup Championship. Front row (left to right): Bob Novak, Gary Demory, Cliff Lett, Frank Killam. In the rear: L.R. Simon and trophy girl Debbie.

OPEN

Fin	Qual	Name	Chassis	ESC	Motor	Batteries	Tires	Body
1	3	Cliff Lett	10L-SS	Novak 410	Reedy 12	Reedy	Yokomo/Atlantic	Lumina SS
2	4	Frank Killam	10L	Tekin 411	Reedy Mr. J	Pro Cell	Twinn-K	Bolink Lumina
3	1	Chip Reisbol	10L	Novak 410	Revtech 12	Revtech	n/a	n/a
4	8	Brian Bowler	Bolink LTO	Tekin 700	Revtech	Revtech	Bolink	Bolink T-Bird
5	6	Joe MacGregor	10L	Novak 410	Revtech 13	Revtech	HPI	Andy's Lumina
6	5	Sterling Banks	10L	Tekin 411	Revtech	Revtech	HPI	Bolink T-Bird
7	10	Gary Hamilton	10L	Tekin	Revtech	Ballistic	HPI	Andy's Lumina
8	2	Gary Demory	10L-SS	Novak 410	Reedy 12	Reedy	Associated	Lumina SS
9	7	Brian Blaser	10L	Novak 410	Twister	Twister	CKW	Bolink T-Bird
10	9	Bob Novak	10L-SS	Novak 410	Reedy	Novak	Assoc./Yokomo	Lumina SS



Pam Huston was all smiles as she helped husband Mike.

his qualifiers would have put him comfortably into the A-Main!! Chip's TQ run was nearly a lap faster than the 2nd-place run of Gary Demory. Lett, Sterling Banks, Brian Blaser, Brian Bowler, Bob Novak and Gary Hamilton also improved on their efforts of the previous day. Only Frank Killam and Joe MacGregor failed to improve (if you can consider Killam's outside spot in the second row a failure?!). After nearly 7 hours, during which 131 vehicles in each round of qualifying passed under, over and even through the timing tower, it was time for the barbecue. Provided by NORRCA and Racer's Haven, the dogs, burgers, salads and all the fixin's were free—a nice touch after a long, hot day at the track.



Judges go over Concours entries before the first heat. Although the Concours field was small, the winners were outstanding.

Two of the most popular and exciting features of NORRCA events are the Annual Trophy Dash and the Team Cup Competition. ● **Trophy Dash.** The top four qualifiers in each class race in a 2-minute winner-take-all event. With batteries smoking and motors geared to the max, top stock qualifiers Jon Vandervort, Bill Ranier, Craig Hamilton and Steve Lantz came to the line before Sunday's Mains. With the temperature in the mid-70s and a cool breeze blowing, the track was in prime shape for blistering lap times.

With Vandervort starting on the pin and being nearly 2 seconds faster than the rest of the field, he was the odds-on favorite to run away and hide. Bill "Say it ain't so" Ranier had other ideas and made the big move off the line—and the rest is history!

Ranier's wire-to-wire win with his OM-10 chassis embarrassed the field; he was the only driver to go 17 laps (in 2:05.53).

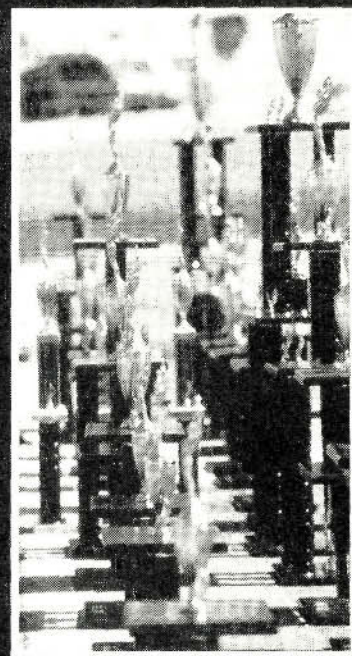
Vandervort, Lantz and Hamilton put on a good show for the 2nd spot and went 16 laps in a group separated by only 1.2 seconds.

● In the all-Associated 10L Open Dash Final, TQ Chip Reisbol (with Revtech motivation) had his hands full holding off Associated's Gary Demory, Cliff Lett and Frank Killam.

At the buzzer, it was Demory with the holeshot through turn 2, followed by Reisbol, Lett and Killam. Lett made sure it would be a Reedy sweep when, going down the back chute, he tagged Reisbol from behind and forced him into the showers early.

Lett set out after the leaders, reeled in Killam and took position with a neat move in turn 1. He got within shouting distance of Demory, but both were turning 6.7-second laps, so there just wasn't enough time to make up the

Top Trophies for Top Drivers



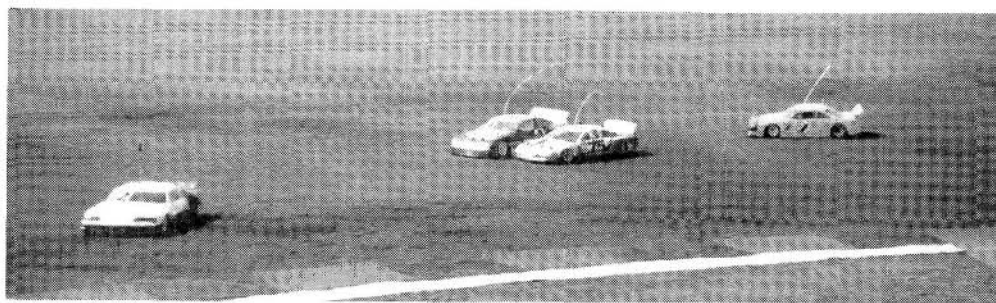
distance.

Demory crossed the line a scant .06 second ahead of Lett, and Killam was about half a track behind. Reisbol parked it earlier for the final spot.

● **Team Cup Competition.** To decide this, the combined scores (based on qualifying and final standings) of four drivers from each team were tabulated. Team Associated continued their winning ways with a close win over Team Revtech, HPI, Bolink and Twister.

STOCK

Fin	Qual	Name	Chassis	ESC	Motor	Batteries	Tires	Body
1	2	Bill Ranier	OM-10	Tekin 700		Power Cells	CKW	Bolink Pontiac
2	8	Mark Dunn	10L	Novak 1X	h	n/a	TRC	Assoc. Lumina
3	9	Don Winans	OM-10	Tekin 600	a	n/a	CKW	Bolink Olds
4	4	Steve Lantz	10L	Novak T-4	n	Revtech	TRC	Assoc. Lumina
5	7	Edwin Barr	scratch-built	Tekin	d	Quantum	HPI/Delta	Bolink Pontiac
6	6	Joe Ward	OM-10	JayMan	-	Quantum	Delta	Bolink Pontiac
7	3	Craig Hamilton	10L	Tekin	o	Ballistic	HPI	Assoc. Lumina
8	1	Jon Vandervort	10L	Novak 410	u	Stealth	TRC	Andy's Olds
9	5	Ryan Klompus	OM-10	Novak 410	t	Power Cells	Associated	Bolink T-Bird
10	0	Kyle Ioffrida	OM-10	Tekin 411		Power Cells	CKW	Bolink Pontiac



Above: Note the absence of wings; spoilers couldn't be more than 2.5 inches from the trunk lid. Right: A topnotch facility, Racer's Haven provided access for the handicapped, so drivers like Rick Blake could take their positions on the drivers' stand.



THE MAINS

Sunday morning was a lot cooler—ideal for fast times. After the Trophy Dash (see sidebar) and lower Mains, the track and temperature started to heat up for the scheduled shootout at high noon.

Amazingly, all 10 cars came away from the first turn cleanly and made a serious charge down the back chute. On the first circuit, pole sitter Jon Vandervort led the field under the tower. Mark Dunn and Don Winans made a charge from the back of the pack and secured a spot in the top five. On the second pass, Vandervort got drilled on the front straight, tripped the timers while on his lid and dropped to the back of the pack. Bill Ranier inherited the

Kyle Ioffrida was the first to call it a day: his chassis failed to survive an encounter with the outside wall. Hamilton worked his way back into the pack and was back up to the 5th spot at the 2:45-minute mark. By this time, Ranier and Dunn had also worked their way though the back markers and had put the entire field a lap down.

With Ranier now pulling away from a fading Dunn, there was still quite a battle going on in the back of the pack as Edwin



OPEN A-MAIN

Revtech's Chip Reisbol held the pin with Associated's Gary Demory on the outside. At the sound of the horn, Cliff Lett showed why he's always such a threat. He made the holeshot from the second row, brought it down on the paint, and came away in 1st place.

After the first pass, it was Lett, Demory, Reisbol and Killam. Bob Novak was still sitting on the line with technical difficulties as the rest of the



Left: Gary McAllister obviously appreciates his 2nd-place finish in the Open Class B-Main. Center: Jim Benincasa was responsible for this great briefcase. Right: NORRCA's weenie roast is always a big hit. J.R. Sitman was on spatula duty for most of the evening.

lead when Craig Hamilton clipped a dot in turn 3 and also went turtle. Dunn was still in 2nd, followed by Steve Lantz, Ryan Klompus and Winans.

At the halfway mark, Ranier started to stretch his lead over Dunn as they both pulled away from the rest of the field.

Barr moved into the top five and dropped Hamilton out of the picture.

At the horn, it was Bill Ranier taking a big win over the solid 2nd-place run of Mark Dunn. Winans, Lantz and Barr (with his scratch-built chassis) rounded out the top five.

field came down on him and kicked him into the cheap seats. (Sorry, Bob, I didn't get the number of that truck!) When the corner marshal had rescued his ride from souvenir seekers, Bob was back in the chase, but he parked it after five laps.

(Continued on page 78)

COMING
NEXT
MONTH!

TOP TEN ISSUE!

FEATURES

Top Ten:

- Cars
- Drivers
- Accessories
- Photos
- Readers' Rides
- Pit Tips

Cleveland Indoor Champs

Florida Dirt-Oval Nats

Tire Balancing

Best R/C Flier in the World!

TRACK REPORTS

Associated Superspeedway

Cox GTP Nissan

Kyosho Burns DX

COLUMNS

Dirt Digest

Scoping Out

Troubleshooting

HOT TRACKS

Here's another in our "Hot Tracks" series of outstanding R/C race courses. To see your favorite track featured here, send us good black-and-white photos and a description of its delights! (approximately 500 words). Send your entries to Hot Tracks, Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



NORTH BAY R/C RACEWAY, SANTA ROSA, CA

JUST 55 MINUTES NORTH of San Francisco, you'll find California's largest indoor asphalt track, which opened in December 1989. Set in a new industrial park, North Bay R/C Raceway and the adjoining hobby shop cover 12,000 square feet. The 55-foot-wide track is 106 feet long, and its 12-foot lanes are great for easy passing.

Go there on Friday and Saturday nights and Sunday afternoons, and you'll find electric oval and on-road racing in $1/12$, $1/10$ and $1/8$ scale. Racing is run according to ROAR rules, but ROAR membership is required only for ROAR-sanctioned races.

Friday night racing starts at 7 and usually finishes by midnight; Saturday's excitement starts at 6 p.m., and on Sundays, be sure to arrive by 1 o'clock. Use of the new Dyna-Trax scoring system means that cars are equipped with transmitters, and scoring is flawless, so there are no number hassles at *this* track!

• **Oval racing:** novice, stock, super stock, modified and unlimited (which is really catching on) races for $1/10$ -scale battery-operated cars. One-eighth-scale electric is also becoming popular, and because the cars are all capable of equal speeds, winning is an indication of driving skill rather than cash investment. The stock class allows a limited choice of motors and batteries, while super stock allows a greater selection. The people at North Bay recognize that too many good stock drivers are beaten by those who just have more money to spend on their rides.

• **On-road racing:** About 10 track layouts are used, and to keep up the challenge, they're changed every month with the use of fire hoses and plow discs.

Winter plans call for races among school R/C clubs. This will be a low-cost program with which the track's owners hope to bring students into the hobby. They're also working on an out-of-the-box stock class for juniors and adults. There's a lot going on!

For more information on location and schedules, contact Bob Peterson or Rick Price at North Bay R/C Raceway, 3200 Dutton Ave. #317, Santa Rosa, CA 95407. ■



THE TOWN OF KING, NC, and Paul Covington's King R/C Speedway played host to the *Car Action Shootout II*, which was co-sponsored by TRC, Trinity, Bolink and Domino's Pizza. This is the eastern segment of the 1/10-scale, oval racing series, during which racers thrash it out, door-to-door, to determine who's the best.

Ricky Jordan's dance lessons proved to be very beneficial as he dodged 50mph cars while marshalling!



PHOTOS BY STEVE POND

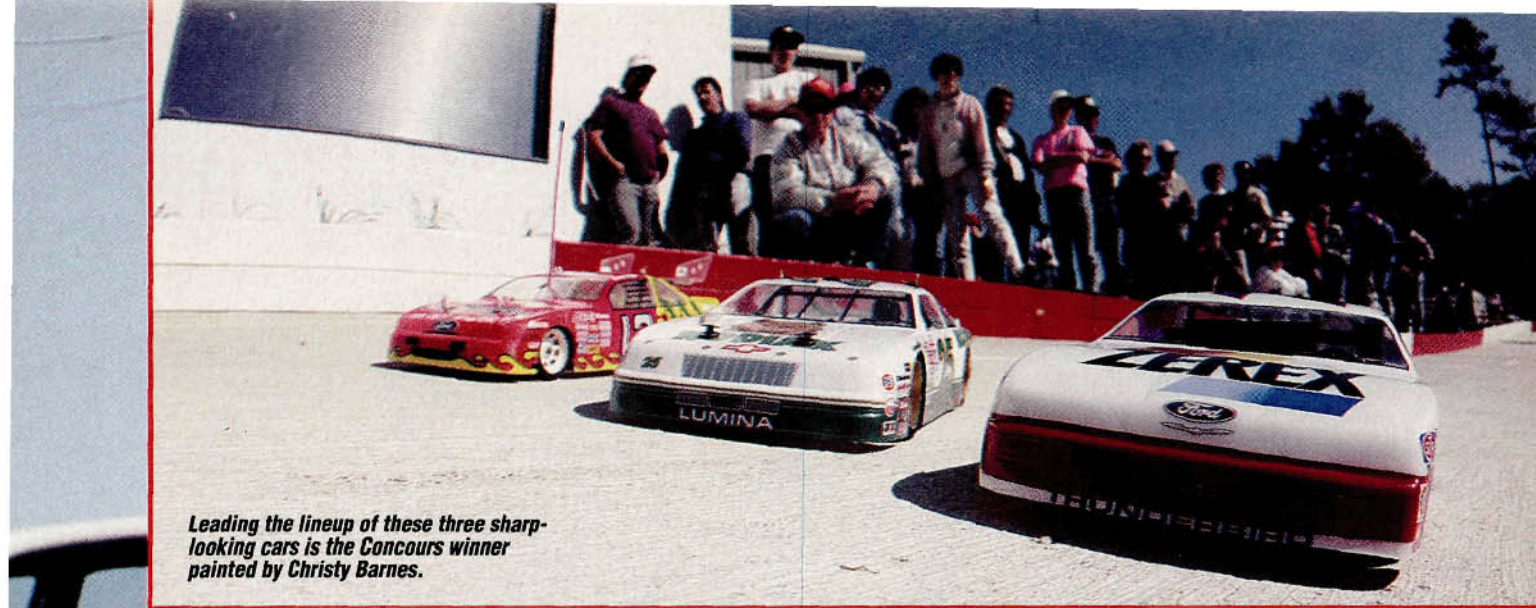
The King R/C Speedway is one of the newest oval-racing facilities on the East Coast. The track is laid out in a tri-oval configuration that seems rough, but racers found it smooth, fast and easy on tires. The starting line is just beyond the tri-oval, which is located under the high drivers' stand.

From the line, drivers negotiate their way through the tight first turn, which has the highest banking. This leads them down the long back straightaway where speeds breach the 50mph barrier. At the end of the straight, the track bends into a banked sweeper that leads back onto the tri-oval for a complete lap.

The infield has no barriers, and this affords the drivers more of a chance to drive away from any error they make at high speeds. The outside barrier is enough to contain the cars in a high-speed crash, but its lower-than-usual height allows spectators an

Ricky Jordan's CAM-powered Bolink car qualified for the Domino's 500 and finished 6th.





Leading the lineup of these three sharp-looking cars is the Conco's winner painted by Christy Barnes.

car action's showdown at thunder road super- speedway shootout

excellent view of the race at any point. The track is behind the PC Hobbies building, which houses the on-site hobby shop and an indoor concrete-oval track.

The event was scheduled to have standard 4-minute heats in both the Stock and Modified

Classes, and the Domino's Pizza 500. There was also an added attraction, the Bolink Classic, which was the brainchild of Chuck Rencurrel. This race was exclu-

b y S T E V E P O N D

II



car action's super- speedway shootout II

sively for drivers over 40. Originally, all the drivers planned to use the Bolink '55 Chevy body, but they in fact used the more contemporary Bolink IROC Daytona. Three 4-minute qualifiers would determine in which Main the drivers would compete, but for the first time at a major national oval event, an extra qualifier would seed the drivers in a given heat.

There has been some controversy about "stacking" the qualifiers in events. What's stacking? It's when an event's organizers allocate drivers to qualifying heats according to their abilities. Left alone, this is a good method that ensures drivers of similar skills race in the same heat, but it left plenty of room for participants to cry "foul" if they weren't



Larry Flowe won the stock class running a Lynx II Elite.

allocated to a heat they thought appropriate.

At the start of the *Car Action Shootout II*, drivers lined up on the pit lane and, one at a time, they ran a single lap. This lap time was then used to seed them in appropriate heats. For the Superspeedway event, drivers competed in three, 125-lap enduro runs to fill the 10 spots on the grid.

PRACTICE

Many of the Invitational drivers, as well as some ambitious amateur participants, showed up on Wednesday—a day early—to try to get a

feel for the track, but torrential rain prevented all but a few early birds from getting any practice. The following morning brought some bright sun, but the unseasonably cold and windy weather turned out to be an additional challenge for the racers. Strong, gusty winds blew down the back straightaway and made the cars' rear ends light. This often sent them into the infield just after they exited the first turn.

Thursday was reserved for open practice and the two rounds of Invitational Class qualifying. Clad in their winter jackets and gloves, the drivers headed out to the track to practice before the 125-lap enduro qualifiers. Of

the more than 300 entrants, the ones to watch included Team Associated's Kent Clausen. He was driving the the car with which he won on the high banks of the Thunderdrome—the new Superspeedway version of the 10L, which had been modified for a quick-change battery setup. The car didn't handle as well as it had at the Thunderdrome, and Clausen attributes this to the more shallow banking on the King Speedway. When combined with the tail winds down the back straight, this made the car a handful, but Clausen managed to hang on pretty well.

In his first competitive appearance for Team Trinity (and one that turned out to



The father-and-son team of Rick and Ricky Jordan practices pit stops for the Domino's 500.

be his last!) Chris Doseck drove a modified Lynx II Elite. His car featured the new TRC Quick-Change battery. It seemed to handle well, and with the horsepower Doseck was putting down, he looked like a strong contender for the feature.

Ralph Burch Jr. and Dave Raber (driving the new Hyper 10SC outfitted with Hyperdrive's battery quick-change system) also made a bid for the 500-lap event. Burch had radio trouble, and he couldn't seem to find the right horsepower combination, so that reduced his chances of making the feature. Raber's car handled well, and though it was a little underpowered, his excellent driving and his pit crew's fast work kept him in the running.

Warren Darby and Craig Perry (driving for East Coast Modified Motors) haven't been seen too much on the paved-oval circuit, but judging from their fast qualifying laps, they promised to be a big threat. Both used Bolink's Enduro quick-change cars. Andy Dobson and Jim Fuller—the newest members of the East Coast Modified's Team—also ran strongly with their Lynx II Elite cars. Notable practice runs were also turned in by Bolink's Ricky Jordan and Phil Simms.

MAKING THE GRADE

All the drivers who competed for a spot in the Domino's 500-lap feature wrestled their way through Thursday's qualifying, which was plagued by foul weather. All managed reasonably successful runs, but it's an understatement to say that they were happy to get it over with, because the cold

and high winds had them wishing they were anywhere *but* atop the mountainous drivers' stand!

When the dust had settled, Warren Darby had taken the pole, and he was followed by Craig Perry, Tim Lanier, Chris Doseck, Bill Horne, Rick Jordan, Dave Raber, Phil Simms, Kent Clausen and Jim Fuller.

The disappointed Andy Dobson, who's usually a front-runner in oval racing, was plagued by broken axles and other broken parts, and this bumped him out of the Domino's 500, while Ralph Burch, who's also a talented oval racer, couldn't shake the radio hits for long enough to sneak in a good qualifier.

Friday's qualifying moved on to half a day of open

practice followed by the first stage of qualifying for the 4-minute rounds that spanned the following three days. As previously mentioned, instead of "stacking" the heats, in the latter half of the day, all the drivers ran a single hot lap that would place them in a qualifying heat. A single lap didn't give drivers much chance to warm up their tires or reflect their ability to run a 4-minute heat, but it did accomplish

The view from the mountainous drivers' stand shows the tri-oval configuration of the track. The pit road runs through the center for the endurance racing.

what it was designed to. Not one complaint was heard about where anyone qualified!

After some early morning practicing on Friday, we kicked off the first of four qualifying rounds for the 4-minute heats. Many of the drivers making a bid for the



car action's super- speedway shootout II

500 also competed in the Modified Class. Clausen started out running a Superspeedway 10L, which is a narrow version of the standard 10L, but it was too much to handle with the shallow banking, so he reverted to the standard car and ran much faster in the final rounds. Doseck ran



ROAR's John Thawley (the emcee for the Shootout II) prowls the pit area while doing his Elvis impersonation. A startled pit member wheeled around to see what in the world sounded so bad!

extremely well with his Lynx II, but he broke a prototype suspension front end in a crash, and he had no replacement parts. This forced him to go back to the stock crossbar axle, which in

fact handled better and improved his time to a point where it was the one to beat.

Right from the beginning, Terry Rott (now running for East Coast Modified Motors) set the track on fire and

guaranteed himself a spot in the A-Main. It wasn't until the later rounds, however, that he came in just a few ticks behind Doseck's fast time to take the second spot on the grid. With his CAM-powered Bolink LTO, Tim Lanier, who had been such a strong runner in the Domino's qualifying, also turned in some hot runs in the 4-minute rounds.

Chris Smith—a very talented dirt-oval racer—made his mark on concrete-oval racing when he locked up a spot in the A-Main with a setup similar to Lanier's. Warren Darby and Craig Perry weren't as strong in the 4-minute runs as they

it's insane!!

at many of the country's large oval-track races, Insane Speed Runs are popular. They're contests in which racers attempt to run at the fastest speeds possible for a prescribed time. The idea is to net the fastest average speed over the standard 1-minute run. Some racers, however, are more satisfied with turning the fastest single lap, but whatever the motives of the entrants, the Speed Runs never fail to pack the sidelines. The showdown

at the King was no exception.

Because of the King's track configuration, blistering speeds would be a rather tall order, but this didn't discourage participants from trying to push the edge of the envelope. One by one, drivers lined up on the infield to have a go at winning the title of "Fastest Driver."

The early pacesetter was Tony Lavoie, who was the first to complete the run without any serious mishaps. His fastest lap netted a top speed of 44mph, and his average was 43.75mph. Chris Doseck was next up with his 12-cell Lynx

II. During his first lap, he made a record-setting run of 49.54mph, but he faded away as fast as his motor, as his speed steadily dropped to 44mph. He was able to average 44.59mph, which was the mark to beat, but with some heavy hitters still to come, there was a good chance his record would be broken—and broken it was.

Only two slots

"grudge match" in which they'd compete in a 2-minute dash. Rott would still hold the title as the fastest, but Doseck would have a chance to get his doors back after losing them in the solo runs!

The flag dropped, and the ticker started its way through 2 minutes as the trio of overpow-



down from Doseck was Terry Rott whose speed only once reached 46mph, but his laps stayed above the mid-45mph range to give him an average of 45.16mph. The next closest challenger was Bolink's Ricky Jordan, who had an average of 44.63mph. Despite valiant efforts by the rest of the drivers, none could beat Rott's speeds, and he won the title of "Fastest Driver" at the Car Action Shootout II! But that isn't the end of the story...

Not one to go down without a fight, Chris Doseck challenged Ricky Jordan and Terry Rott to a

ered cars went at it side by side. Doseck started out strongly, but his motor went south again, he dropped back and had to bow in defeat for the second time. The race shaped up between Rott and Jordan, but Rott's batteries were feeling the strain as the 2-minute mark approached. Jordan was able to get by Rott to finish 1st. Jordan went back to the pits with a smile—just like Rott, who still holds the top honors for another year.

had been during the Domino's 500 qualifying, but they ran fast enough to land a spot in yet another A-Main with their East Coast-powered Bolink LTOs.

Driving a Twister-powered Lynx II, Mike Boylan also managed an A-Main qualifier, as did Garry Warren and Andy Dobson.

Stock qualifying highlights included local talent Mike Moore as the top qualifier (driving a Bolink LTO) and Mike Hudson in the 2nd spot (driving a Lynx II Elite). Filling out the A-Main in the Stock Class were: Larry Flowe, Tommy Mooneyham, Steve Roberts, Tim Holland, Steve Brown, John Morris, Forrest Whitson and Richie King. Except for Whitson, Brown and Moore, they all drove TRC/CompositeCraft Lynx II Elite cars.

The top three qualifiers in the Bolink Classic were Bill Horne (driving a Lynx II), Phil Simms (driving a Bolink LTO) and John LaVoie (also driving a Bolink LTO).

CONCOURS CONGRATULATIONS!

On Sunday, following the final round of qualifying, racing culminated with the Mains, but before that, it was concours time! We saw some of the most beautiful bodies (car bodies, that is!) ever seen on an oval track. With the "Mold Master" Mike Houge, of Houge Enterprises, I was privileged to be a judge; we scoured through the field of cars that stretched down the front straight and through the fourth turn. There was only one trophy, so the decision was a tough one, but there was an obvious winner: the beautifully painted Bolink T-Bird of Christy Barnes and Chris Rice. Rice was

entered in the race, and the body was sitting on his chassis, but Barnes had done the lion's share of the paintwork. Congratulations to both.

While the drivers picked up their cars and headed back to the pits after the concours, the King staff gave the track a once-over and then gave the go-ahead for the 1990 *Car Action* Shootout II!

FEATURE FUN

As always, the program started with the lower Mains and worked up to the feature events in all four classes.

● **The Stock Class** kicked off the A-Mains, and many talented local drivers starred in the show. Mike Moore, who had started from the pole position, had to take a back seat to 3rd qualifier Larry Flowe, who ran fast from the start and never looked back. Tim Holland, coming from the 6th spot on the starting grid, made his way through traffic and breathed on Moore's fender for the 3rd finishing spot just 16 seconds behind at the finish. Steve Roberts and Mike Hudson rounded out the top five by finishing on the same lap as the leaders with only 3 seconds separating them!

● **The Modified Class** A-Main was next, and it turned out to be the show of the weekend, because the number 1 and 2 qualifiers waged a driving war that kept all of us on the edges of our seats. At the starting horn, Terry Rott got the holeshot with his East Coast-powered Bolink LTO, and he was followed by Tim Lanier, who came from the 3rd starting position with his CAM-powered Bolink car. Doseck, with a less-than-desirable start from the pole, followed in the 3rd position with a Trinity-powered Lynx II Elite.

Within the first few laps,

CURSED COMPUTERS

Living in a "digital" world has its drawbacks. One that seems to be affecting R/C racing is the inability of the popular computer lap-counting systems to score races accurately. It's not that the quality or accuracy of the available systems has declined; our cars are traveling faster than ever, but they seem to use equipment that's as compatible with computers as Roseanne Barr is with the national anthem. Until technology comes to our rescue, we'll have to learn to live with problems like those experienced at the Shootout.

During the Domino's Pizza 500-lap event, the B&B scoring software that had previously worked without a glitch couldn't manage to count beyond 125 without completely shutting down.

As you can imagine, there were mixed emotions when competitors heard that 125 laps were a wash and that they'd have to start from scratch. Tempers flared—most notably that of Tate McDaniels (CAM Motors) when one of his sponsored drivers, Tim Lanier, had to surrender a five-lap lead.

In a rather unsportsmanlike gesture, McDaniels threatened to pull his hardware and sponsorship from anyone (five of the 10 drivers) who wished to continue the event without the race directors' agreement to give Lanier a five-lap advantage! Some even insinuated that the race announcer, John Thawley, had pulled the plug when he saw that his "favorite" team wasn't running well. This was clearly not the case, as the computer pulled a repeat performance during the attempt to re-run the race.

The disappointment of having to surrender the lead because of a computer problem is understandable, but to attack the character of those who worked so hard to make the event enjoyable is to demonstrate a lack of professionalism. Fortunately, a change of heart allowed all the drivers to compete in an abbreviated version of the Domino's race, and Lanier finished a strong 2nd.

The moral of the story? If you're ever faced with a similar situation, it's OK to be disappointed, but don't blame others for a situation that's clearly uncontrollable. Just grit your teeth and come out running as fast and as hard as you did the first time through!

Doseck was able to pass Lanier and set his sights on Rott. Doseck followed Rott closely until the 2-minute mark when he was tied up by lapped traffic and allowed Rott to stretch his lead to about half a lap. When racing among such experts in an event like this, such a

mistake would generally cost you the race, but a bobble by Rott allowed Doseck to close the gap. With 45 seconds remaining, while Rott and Doseck were weaving through traffic, Gary Warren drove between them and touched Doseck's car. This helped Rott to

car action's super- speedway shootout II

stretch out his lead again—this time, to about a quarter of a lap. With only 30 seconds to go, it looked as though Rott would walk away with it, but as Rott came off the back straight into turn 3, a lapped car touched his and slowed it just enough to allow Doseck to get by for the lead.

Only a few seconds remained, but both Doseck and Rott made it over the line before the buzzer, and this meant they were going for another lap. Only a few feet separated the two cars; Doseck came out of turn 4 in the lead, and Rott realized there was no way to get around him before crossing the line. He put the pedal to the floor and rear-ended Doseck's car, so both cars went into a spin only 1 foot from the line. Running in 3rd, Kent Clausen closed the gap as the other two struggled to point their cars in the direction of the finish line. They crossed the line before Clausen, and it looked as if Doseck had finished an inch ahead of Rott for the closest race of the weekend. We later discovered that the computer had shown Rott's car ahead of Doseck's, so Rott was the Modified champion of the 1990 *Car Action* Shootout II!

BOLINK CLASSIC

In the Bolink Classic, more than 40 drivers ran the Bolink IROC Daytona bodies and East Coast handout stock motors. The lead for

this race was traded so many times that even Motown's motor-mouth announcer, John Thawley, was confused! Like a roller-derby team slingshotting the jammer ahead of the pack, the Classic A-Mainers traded the lead no less than four times, with Lin Vaughan, Tommy Boles, Bill Horne and Pat Arrington all getting a taste of what it's like to lead the pack.

Toward the end, it was

Horne in the lead and Phil Simms on his tailgate and challenging for the lead. With time running out, the two were collected by a back marker, and this allowed Arrington to slip by for the 1st spot while Dave Pulfer swept into 2nd. After that, it was time for what was supposed to be the feature race of the weekend....

ONLY 500 LAPS TO GO!

Originally scheduled for

Friday, the Domino's 500 was re-scheduled for Sunday to allow more spectators to see this main event and to avoid the cold weather. After the pit crews for the 10 fastest drivers out of the 125-lap qualifiers had set up shop on the infield, the command was given to start the 500-lap event.

The drivers got off to a reasonably smooth start for what promised to be an exciting 500 laps, but at the

Stock

Fin	Qual	Name	Chassis	Motor	ESC
1	3	Larry Flowe	TRC Lynx II		Tekin 300
2	1	Mike Moore	Bolink LTO	h	Novak T1
3	6	Jim Holland	TRC Lynx II Elite	a	Novak 410 M1c
4	5	Steve Roberts	TRC Lynx LTO	n	Tekin 600
5	2	Mike Hudson	TRC Lynx	d	Novak T1
6	9	Forrest Whitson	LTO		Novak T1
7	10	Richie King	TRC Lynx Elite	o	Novak T1X
8	8	John Morris	TRC Lynx II LTO	u	Novak T1X
9	7	Steve Brown	Bolink LTO	t	Novak T1
DNS	4	Tommy Mooneyham	TRC Lynx II		Novak 1

Domino's 500

Fin	Qual	Name	Chassis	Motor	ESC
1	1	Warren Darby	Bolink LTO	East Coast	Novak
2	3	Tim Lanier	Bolink QC	CAM	Tekin 410
3	9	Kent Clausen	Assoc. RC10L	Reedy Mr. H	Novak 410 MXc
4	8	Philip Simms	Bolink LTO	CAM	Novak 410 MXc
5	5	Bill Horne	TRC Lynx	CAM	Novak
6	10	Jim Fuller	TRC Lynx II QC	East Coast	Novak T1X
7	6	Ricky Jordan	Bolink Enduro	CAM	Novak T1
8	7	Dave Raber	Hyper 10	CAM	Novak T1X
9	4	Chris Doseck	TRC Lynx II	Trinity	Novak MXc
10	2	Craig Perry	Bolink Elim. QC	East Coast	Tekin 700

Modified

Fin	Qual	Name	Chassis	Motor	ESC
1	2	Terry Rott	Bolink LTO	East Coast	Novak MXc
2	1	Chris Doseck	TRC Lynx II LTO	Trinity	Novak MXc
3	3	Kent Clausen	Assoc. TC10L	Reedy Mr. J	Novak 410 MXc
4	5	Chris Smith	Bolink LTO	East Coast	Novak MXc
5	6	Andy Dobson	TRC Lynx II	East Coast	Novak MXc
6	4	Tim Lanier	Bolink LTO	CAM	Tekin 700
7	7	Craig Perry	Bolink LTO	East Coast	Novak T1X
8	10	Gary Warren	Bolink LTO	CAM	Novak MXc
9	8	Mike Boylan	TRC Lynx II	Twister	Tekin 411
10	9	Warren Darby	Bolink LTO	East Coast	Novak Stealth

Bolink Classic

Fin	Qual	Name	Chassis	Motor	ESC
1	5	Pat Arrington	Bolink		Nosram
2	9	Dave Pulfer	McAllister	h	Tekin 700
3	1	Bill Horne	TRC Lynx	a	Tekin
4	6	Jim Weeks	TRC Lynx	n	Tekin 600
5	4	Lin Vaughan	Hyper 10	d	Novak
6	2	Philip Simms	Bolink LTO		Novak 410 MXc
7	10	Ron Alba	Hyper 10	o	Tekin
8	7	Bill Henneforth	TRC Lynx II	u	Tekin 610
9	8	Tommy Boles	TRC Lynx II Elite	t	Novak T1
DNS	3	John LaVoie	Bolink		Novak

Charger	Tires (front l/r, rear)	Radio	Body	Sponsors
Tekin BC210	TRC gold/sil, gold	Futaba PCM	Bolink LeBaron	
Turbocharger	Bolink gold/sil, gold	Futaba PCM	Bolink '90 Pontiac	Bolink, PTI
Tekin BC 100	TRC gold/sil, gold	Futaba PCM 1024	Bolink T-bird	TRC/PC Hobbies
Navcom 12 Plus	Pro-Line RED	Futaba PCM	Bolink Lumina	East Coast, Advanced Electronic Innovation
HI-IQ Senior	TRC gold	Futaba Magnum Jr.	Bolink T-bird	Hudson Racing, East Coast
Turbocharger	Bolink gold/sil, gold	Futaba PCM 1024	Bolink PTI	
Victor	n/a	Futaba Jr.	Bolink '90 T-bird	Lady & King Farm, BCM Auto Parts, AAA Model Supply
Turbocharger	TRC gold	Futaba AM	Bolink T-bird	
Tekin	TRC gold/sil, gold	Futaba Magnum	Bolink Lumina	
Tekin BC100L	TRC sil, gold	KQ EXII	Bolink '89 T-Bird	

Charger	Tires (front l/r, rear)	Radio	Body	Sponsors
Novak	TRC gold, sil/gold	KO EX9	Bolink '90 Pontiac	East Coast, Novak, Bolink
Tekin	Bolink TM gold	KO EX9	Bolink '90 Pontiac	Bolink, CAM, Team Smooth, Peachbowl Speedway
Novak Peak Plus	TRC gold	Futaba PCM	Bolink Pontiac	Associated, Reedy, LAVco, Novak, TRC, Futaba
Novak	TRC gold	KO	Bolink T-bird	CAM, Houge, Bolink, Novak
Novak	TRC gold cap	Futaba Magnum Sr.	Bolink '90 T-bird	CAM, Team Smooth, Pro Proven, Bad Dog Perf. Prod.
Novak Linear	TRC gold, 1/8 stagger	Futaba PCM 1024	Bolink Pontiac	CompCraft/TRC, Futaba, Novak, East Coast
Novak	Bolink TM radial gold	Futaba PCM FM	Bolink '90 Pontiac	Bolink, CAM, Futaba, PTI
Benson	TRC gold	Futaba Magnum Sr.	Bolink T-bird	Lightning Volt, CAM, Hyperdrive, North Augusta Hobbies
Novak	TRC gold	KO EX1	Bolink Pontiac	Trinity, TRC, Novak
Victor HI-IQ	Bolink TM radials	Futaba PCM 1024	Bolink Pontiac	Bolink, Futaba, East Coast, Team Smooth, North Georgia R/C

Charger	Tires (front l/r, rear)	Radio	Body	Sponsors
Novak Peak Plus	Bolink TM radial gold	KO EX1	Bolink '90 Pontiac	Bolink, East Coast, Novak, Bud's
Novak	TRC gold	KO EX1	Bolink Pontiac	Trinity, Novak, TRC
Novak Peak Plus	TRC gold	Futaba PCM	Bolink Pontiac	Associated, Reedy, LAVco, Novak, TRC, Futaba
Novak	TRC gold	KO EX1	Bolink '90 Pontiac LW	East Coast, Bolink, King R/C, Novak, Custom Works
Novak	TRC gold	Futaba 3LGX	Bolink Pontiac	CompCraft/TRC, East Coast, PTI, Novak
Tekin	Bolink TM gold	KO EX9	Bolink '90 Pontiac	Bolink, CAM, Team Smooth, Peachbowl Speedway
Victor HI-IQ	Bolink TM radials	Futaba PCM 1024	Bolink Pontiac	Bolink, Futaba, East Coast, Team Smooth, North Georgia R/C
Novak	Bolink gold	Futaba PCM	Bolink '90 Pontiac	CAM, Bolink
Benson	TRC black golds	Futaba PCM	Bolink Pontiac	Twister, Team Smooth, Braun Hobby, Winners Circle Bodies
Novak	TRC gold	KO EX9	Bolink '90 Pontiac	East Coast, Bolink, Novak

Charger	Tires (front l/r, rear)	Radio	Body	Sponsors
Tekin	TRC radial gold	Futaba	Bolink IROC Dodge	East Coast
Accu-Charger	Twinn-K red/yellow (f/r)	KO EX1	McAllister T-bird	Wimpy/Gonzo, Twinn-K, McAllister, Dan's
Novak	TRC gold cap	Kraft KP3KW	Bolink '90 T-bird	CAM, Team Smooth, Pro Proven, Bad Dog Perf. Prod.
Tekin	Twinn-K yellow/red (f/r)	Futaba PCM	Dodge Charger	AEI, King R/C, PC Hobbies
Turbocharger	TRC gold	Futaba PCM	Andy's '89 Pontiac	Fast Racing, Hyperdrive, CAM, Jaco
Novak	TRC gold	KO	Bolink T-bird	CAM, Novak, Houge, Bolink
Navcom	TRC gold radial	Futaba PCM	Bolink Dodge Daytona	Mid-Carolina Superspeedway
Navcom 10+	n/a	Futaba Jr.	Bolink Dodge Daytona	
Navcom 10	TRC gold/sil, gold	Futaba Magnum AM	Bolink Dodge Daytona	
Navcom	Bolink caps	Futaba 2PB	Bolink Dodge Daytona	LaVoie Equipment, CAM, Fast Racing

125-lap mark, a problem with the B&B computer software brought the race to a halt. We had earlier seen some of the typical minor computer problems associated with electronic lap counting, but none as devastating as this. Not only did the computer jam at 125 laps, but it also completely wiped out all information on the drivers' positions up to that point. It was impossible to continue the race, and

after much debate and displays of temper by a few of the manufacturers, the organizers made the only equitable decision—to start from scratch.

The drivers lined up again for what they hoped would be a 500-lap event, but again, the software failed—again, at 125 laps! At this point, many of the drivers became frustrated and restless, so instead of making another, possibly futile, at-

tempt to run 500 laps, the organizers decided to run 125 laps and then determine the winner by combining the information from both attempts.

The second leg of what had become the Domino's Pizza twin 125s went off without a hitch, and the combined results determined the winner—Warren Darby, who drove an East Coast-powered Bolink machine.

This unfortunate turn of

events blemished what was otherwise a fantastic weekend. The event's host, Paul Covington, and the staff of the King R/C Speedway worked hard to make this a great experience for all the racers and spectators, and I say they succeeded.

On behalf of the *Car Action* staff, I congratulate the racers and give a big thanks to the sponsors and to Paul Covington's King R/C Speedway.

true- sports,

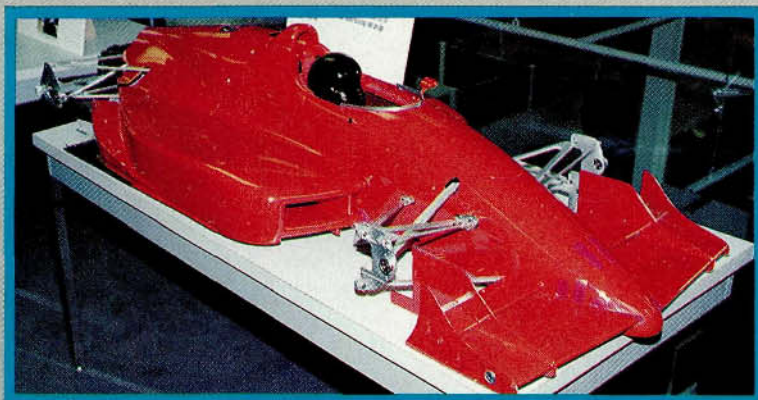
INSIDE



Left: During the open house, Budweiser let visitors use its racing simulator to give them an idea of what it's like to drive a variety of racing vehicles. Above: Scott Pruett took time out to put in some hot laps with his Budweiser R/C Indy car.

by STEVE POND

MANY OF US became interested in R/C because of our enthusiasm for full-scale auto racing. The thrill of thrashing around in the pits or blazing around a track at seemingly impossible speeds is part of what intrigues us. Even more riveting is what goes on away from the race track—how the cars are designed, built, tested and retested to make sure they perform well. This process isn't difficult to see at R/C races—the “garage” is only as far away as the racers' portable worktables!—but what goes on behind the scenes of full-scale auto racing remains a mystery.



In the model-making shop, there's a 1/4-scale version of the team's Indy car. How'd you like to throw a 23cc engine in this thing and do some hot laps?!

Recently, I was offered the opportunity of a lifetime—a chance to check out a full-blown CART racing operation!

Every year, TrueSports—the team that's responsible for the racing efforts of Scott Pruett (in the Budweiser Indy car) and others—opens its doors to the public for a fundraiser to benefit the Easter Seals Foundation. Among this year's many attractions was an R/C track set up for visitors to use and occasional driving appearances by Scott Pruett and Paul Tracey (TrueSports' newest driving talent). Kim Carmine of TrueSports invited Chris Diedling (of Graphic Action) and me to take part in the festivities with some Indy-clad, 1/10-scale, electric-powered cars.

inside racing

THE TRUESPORTS EMPIRE

Founded in 1982 by James R. Trueman, TrueSports is a motor-sports marketing firm that consists of four primary groups:

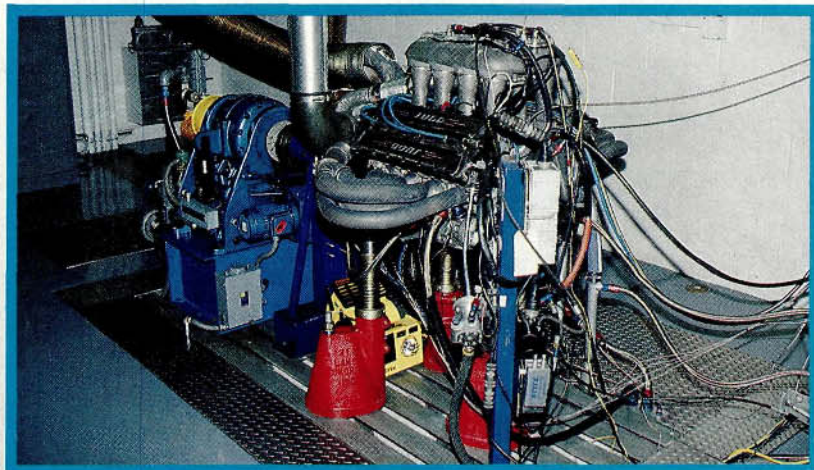
- *TrueSports Racing's* credits include many national and world titles, e.g., Bobby Rahal's back-to-back PPG Indy Car World Series titles in the Budweiser Indy car; Didier Theys' 1987 American Racing Series Championship win; Ed Pimm's 1st-place finish at the 1983 Super Vee Championship; and Colin

Trueman's 1988 Formula Atlantic "Rookie of the Year" award. The team's most recent accomplishment?

—Scott Pruett's "Rookie of the Year" award at the Indy 500.

- *TrueSports Choice*, the company's retail/wholesale distribution network, was formed in 1987. Its product line includes hardware and accessories for race cars and high-performance street cars. The company's discriminat-

ing standards allow only products used by, or tested to the satisfaction of, the TrueSports racing team to



Above: The dyno room is where they find out whether the design changes that have been made to the engine's components helped.

Below: Visitors were allowed to sit in Pruett's Indy car for snapshots.



PHOTOS BY STEVE POND

headquarters!



FLASH!!!

East Coast
Dirt Oval Champs
1st in 2WD &
4WD Mod.
TQ in 2WD
1/10 Dirt Oval
ROAR Nats
1st in Stock

CELL REMATCHING: Voltage and discharge time using Lavco Computer at 10 or 20 amps. Pack teardown and cell cleaning 50¢ per cell. Shipping UPS surface, \$3. Pack assembly is available.

Also, call about our great line of R/C cars and race-ready accessories, plus our weekly specials. TRC's new composite wheel, capped tires, Lynx Elite and Sport, Associated 10L and a complete line Custom Works parts and accessories.

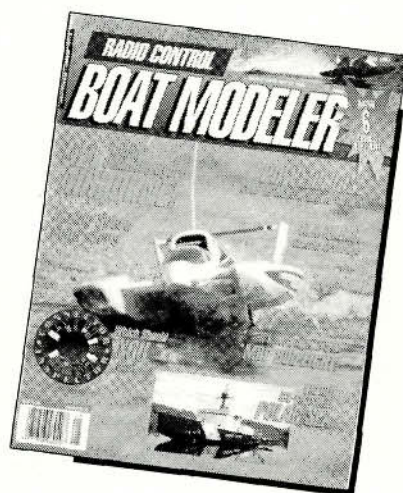
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ON NEWSSTANDS AND IN HOBBY SHOPS EVERYWHERE



FOR THE R/C
BOAT
ENTHUSIAST

open house

pass through its doors.

• Formed in late 1989, *TruePower* is the company's research and development division, which operates a servicing and rebuilding facility for high-performance racing engines. Located at the corporate headquarters, this division uses two computer-

ized, fully equipped engine dynamometers for the finest tuning.

• *TruePerformance* is a full-service restoration facility for vintage race cars and classic European cars. This division was founded in early 1990.

THE GRAND TOUR

On entering the TrueSports facility, we were greeted by a display of the CART medical safety unit. Because the team drivers rely on these units to



During the tour of the engine shop, this young enthusiast got a lesson on the basics of a not-so-basic, dual-overhead-cam cylinder head.

save their lives in the event of an accident, they're staffed by the most competent medical technicians.

The next stop was a display of the PPG Corvette and Dodge Stealth pace cars, which lead the way to the start of all the races. Just down the line were two of the team's car haulers. One was set up for display, while the other carried the equipment used in the pit-stop demonstrations. The pit crew simulated racing condi-

tions by refueling a car and changing all four tires while racing against the clock.

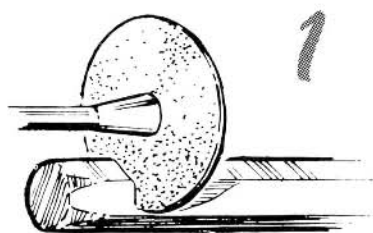
Outdoor attractions included a ride in the Budweiser simulator. There, visitors experienced the thrill of racing in all types of Budweiser-sponsored vehicles. In the Budweiser pavilion, many of this sponsor's most popular race cars were on display, including Kenny Bernstein's retired top-fuel funny car

(Continued on page 110)



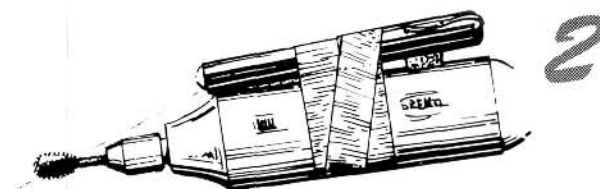
Scott Pruett and Paul Tracey swapped paint on TrueSports' temporary R/C track. Visitors could also try their hands at R/C racing.

HOMEMADE HINTS FOR YOUR TOOLBOX...



ALLEN-KEY REPAIR

Restore worn hexagonal Allen keys to a like-new condition by cutting off the worn end with a Dremel cut-off disc. You're left with crisp, sharp corners.



WORK LIGHT

A Penlight and suitable shim taped to a Dremel grinder will help you to direct light into dark corners.

25 TOOL TRICKS

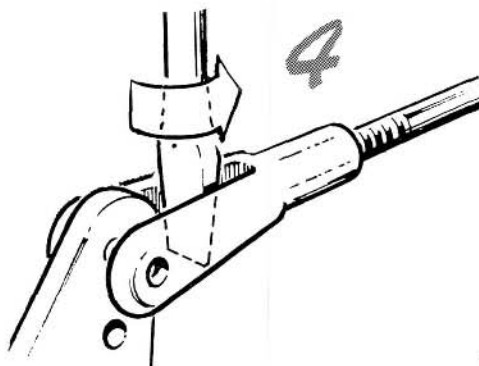
ILLUSTRATIONS BY JIM NEWMAN

The most important workshop ingredients are tools, and having the proper ones for specific jobs makes our lives much easier. Many of the tools we need are common items like pliers and screwdrivers, but sometimes, you have to improvise and make something new. Many of the things you'll need to do this are in your home and just waiting to be discovered. Here's a collection of ideas taken from the pages of Radio Control Car Action, Model Airplane News and Radio Control Boat Modeler. They were all submitted by our readers, so check them out; they may just make life a little easier for you.



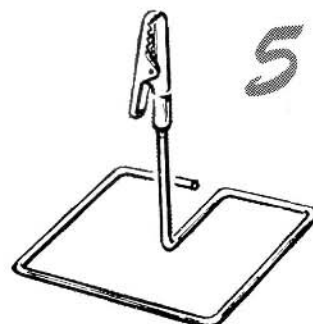
SOLDERING HELP

To hold small parts in the correct position for soldering, stand them in a container filled with sand.



CLEVIS OPENER

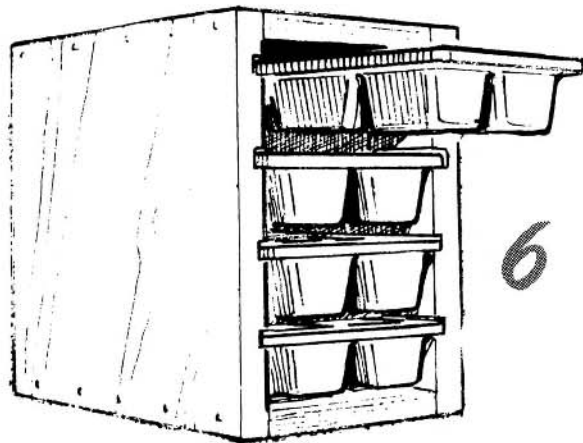
Metal or nylon clevises pop open easily with a twist of a small screwdriver.



THIRD HAND

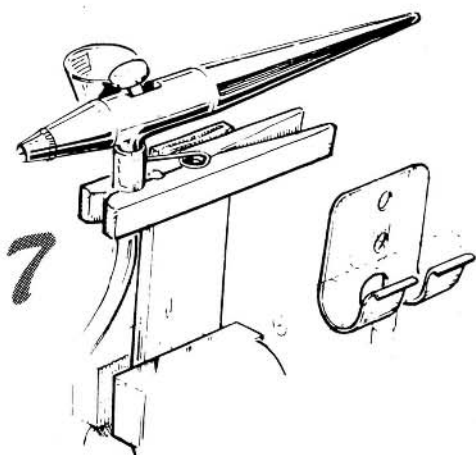
Make this useful "third hand" by soldering a bulldog clip onto a bent coat-hanger. You can file off the jaws and glue in balsa pads to hold small pieces of wire while you're soldering them, and you can also use a "third hand" for those tricky gluing jobs.

25 TOOL TRICKS



SMALL-PARTS RACK

This handy small parts rack is made of inexpensive, plastic, ice-cube trays. Make a wooden box, and groove the sides to take the trays or, in a slightly larger box, glue strips to form runners for them.



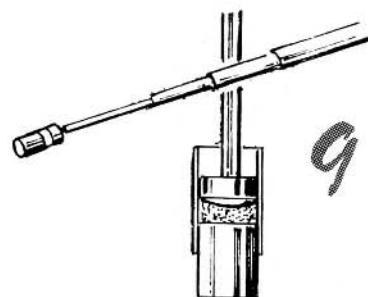
AIRBRUSH HOLDER

If you set down your airbrush while you're working, you're sure to have a spill. Hold it with a clothespin that's glued to plywood and clamped in a vise. Professional illustrators use the bent metal clip shown. It leaves you with one hand free to hold the part you're painting.



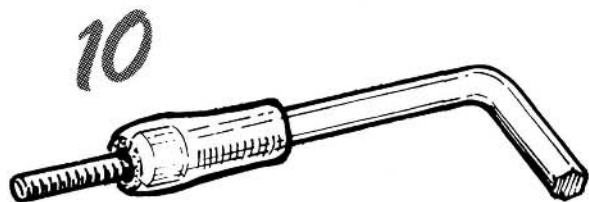
SOLDERING-IRON REST

You can quickly make a useful soldering-iron rest by bending a coat hanger as shown.



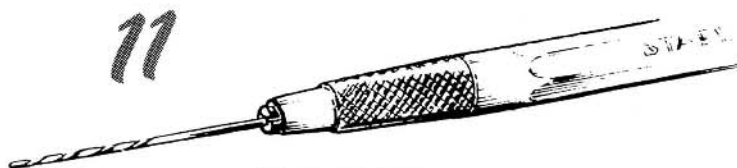
MAGNETIC RETRIEVER

Make this useful tool for retrieving small metal screws, etc., that you drop into inaccessible places. Epoxy a small Radio Shack button magnet to the end of an old antenna. (Put masking tape around the magnet to form a dam that holds the epoxy while it cures.) Leave a gap between the magnet and the antenna to avoid making the latter one into a long magnet.



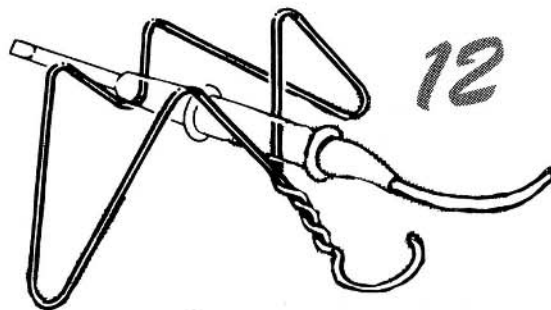
SCREW HOLDER

Use a piece of rubber fuel line to hold screws on your screwdriver while you screw them into hard-to-reach places. This also works well with Allen wrenches.



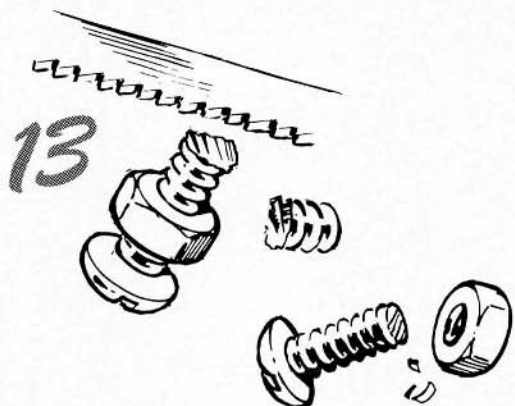
MINI DRILL

This idea is great for those who work on small models and plastic kits. You can hold tiny drill bits in the chuck of a mechanical pencil and drill holes by twirling the pencil.



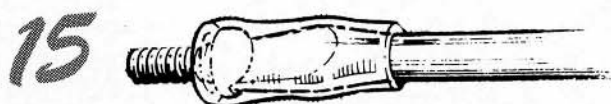
SOLDERING-IRON REST

Here's another neat soldering-iron rest made with coat-hanger wire. This one is glued to a tin lid.



13 REMOVING BURRS

If you want to shorten a screw, put a nut onto it before you start sawing. On the sawn end, there will be a heavy burr, but this will be removed when you take off the nut.



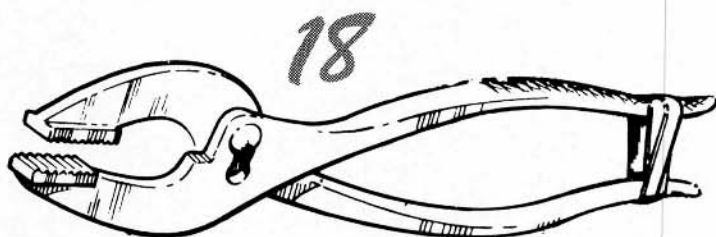
15 SCREW STARTER

Put a short piece of surgical-rubber fuel tube over the end of a screwdriver to hold screws securely while you're screwing them into hard-to-reach places.



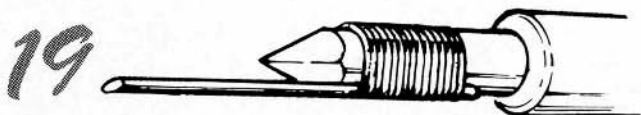
17 EXTENDED DRILLS

Drill in places you never thought you'd be able to reach! Make an extended drill by silver-soldering a drill bit into brass tube of the appropriate size.



18 HANDY CLAMP

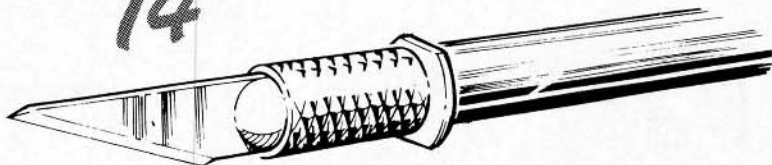
Put a rubber band around its handles to turn a pliers into a useful clamp and "third hand."



19 MINI SOLDERING TIP

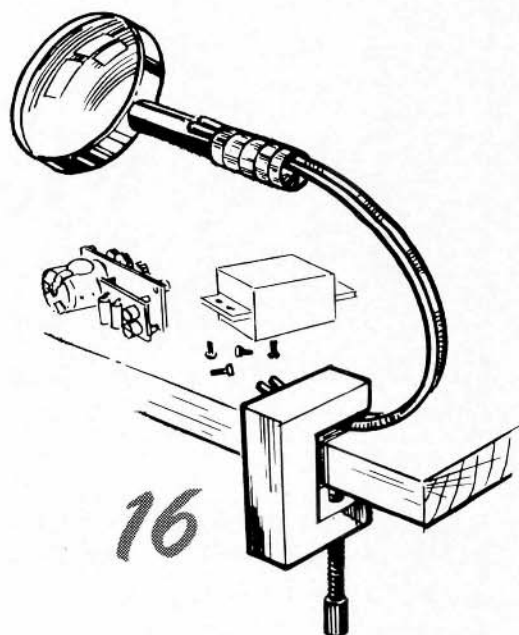
Do you need a smaller soldering-iron tip? Use no. 22 copper wire to bind a piece of no. 14 solid copper wire to the tip of your soldering iron. For better heat transfer, flow solder onto the bound, no 22, wire.

14



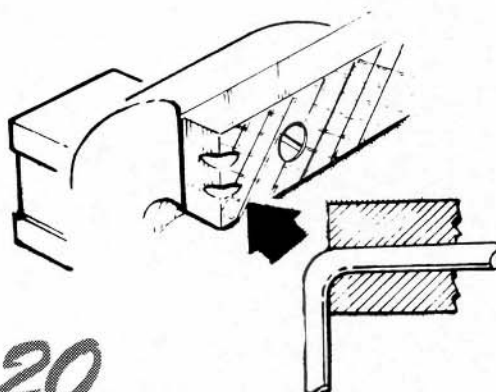
X-ACTO SAFETY

To prevent your X-Acto knife from rolling off your workbench, slide a metal or a ply washer with flat edges onto its handle, just behind the finger grip.



16 MAGNIFYING-GLASS HOLDER

Tape heavy wire (e.g., electrical or coat-hanger wire) to your magnifying glass, and clamp the wire to your workbench, as shown. This will be a real help with fine work.

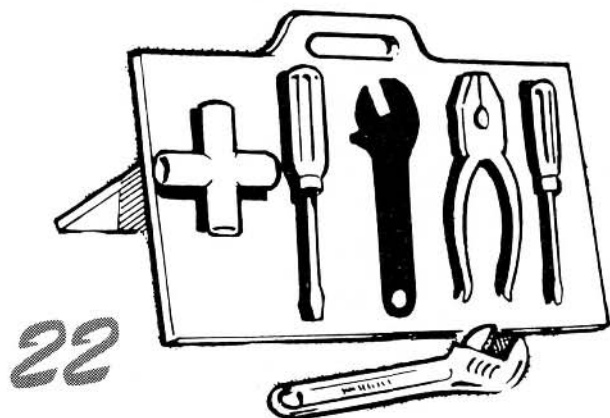


20

WIRE-BENDING "JIG"

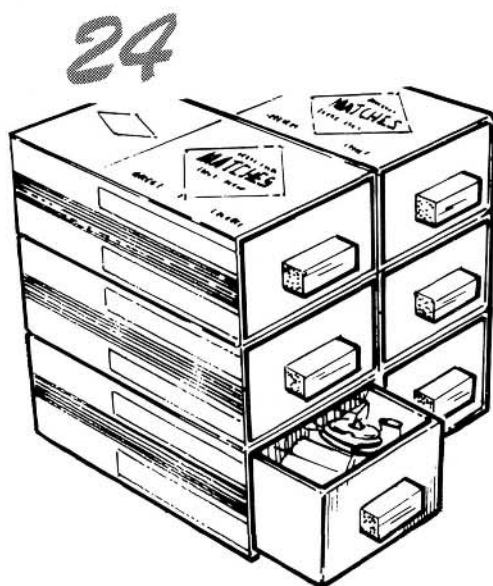
Grind and file smooth, semicircular notches of various sizes into the side of your vise jaws. Clamp the wire by closing the jaws and bend it around the appropriate notch. Use this method to avoid damaging music wire when you bend it to make wing struts.

25 TOOL TRICKS



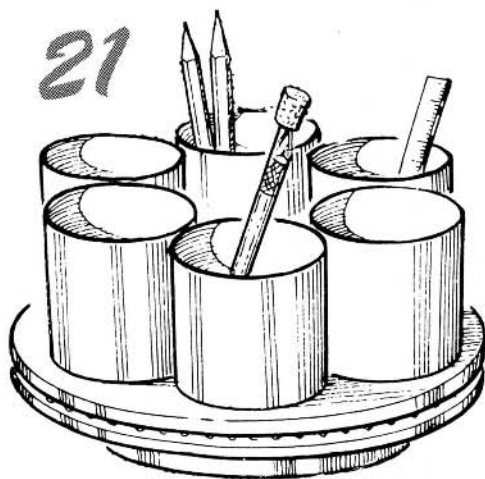
TOOL CADDY

A tool caddy with painted silhouettes reminds you that you're about to leave a tool behind when you leave the track. The board can stand as shown, or be a pull-out shelf in your toolbox.



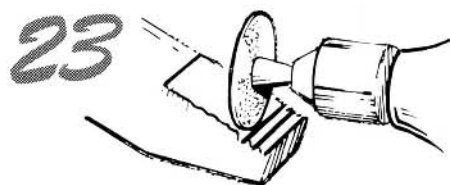
DRAWERS FOR SMALL PARTS

Glue large matchboxes together and, to improve their appearance, cover them with contact paper.



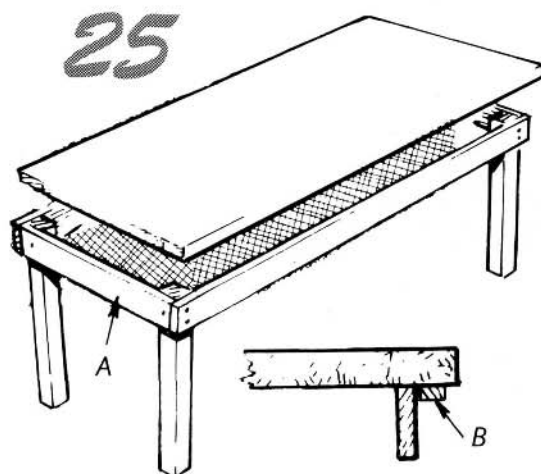
BENCH CADDY

Find a Lazy Susan turntable at a garage sale, and glue cylindrical plastic or cardboard containers onto it. It will be a fine bench caddy for small tools, Dremel cutters, etc.



REFURBISH PLIERS

Refurbish the worn teeth on pliers with a Dremel Moto-Tool cut-off wheel. The pliers won't be as good as new, but they'll be much better than before.



WORK TABLE

"Reject" hollow doors are relatively inexpensive and make excellent work tables. Use 1x4-inch wood for the frame and 2x2 for the legs. Only the pieces marked "A" are screwed to the legs, so the side rails may be removed for storage. The door just rests on the frame and is positioned by strips (B) nailed and glued in four places. Make sure your table is horizontal!

AGITATOR XII

(Continued from page 40)

and keep all the heavy wires away from the receiver and the antenna. I had no radio problems, but since the Agitator has so much conductive graphite, it might be wise to raise the receiver or tip it on its side.

To complete this project, I installed an Andy's* Sauber Mercedes body with a wing and then painted it. For this project, I used a full set of TRC's* new, 1/12-scale, capped (Gold) tires for pavement and a Wild Thing 14-turn, double modified motor from Peak Performance*.

AT THE TRACK

After some minor tuning, I took the Agitator XII to the Sugar Hollow Speedway Tri-Oval—a concrete track in Danbury, CT. Considering this car's size, I was quite impressed with its handling. Even the rough spots weren't a problem, and its lap times were very good—especially taking into account that it runs on only 4 cells.

I was just as impressed with the car's performance when I ran it indoors on a carpeted roadcourse set up by the BORRA

Club (also in Danbury, CT). You can make many adjustments to dial-in this car to a variety of tracks.

If you're one of the many 1/12-scale fanatics, you should consider the Agitator XII. The results in the published race reports prove that it's a great performer.

**Here are the addresses of the companies mentioned in this article:*

Advanced Racing Technologies, 460 Cypress Ln., Ste. F, El Cajon, CA 92020.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

Team Smooth, 311 S.W. 79th Terr., North Lauderdale, FL 33068.

Andy's R/C Products, 1710 Grevelia Ct., Ontario, CA 91761.

TRC, P.O. Box 1058, 2211 Charter St., Albemarle, NC 28002.

Peak Performance, 150 Los Obreros Ln., Ste. G, San Clemente, CA 92672. ■

NORRCA NATS

(Continued from page 52)

Brian Blaser brought out the first "caution" flag when he looped his CKW-sponsored mount in turn 1. Lett went by cautiously, and this allowed Revtech's Reisbol to move in on him and teammate Killam.

Reisbol blasted past Killam in turn 3 and took off after Lett. Back in the pack, MacGregor, Bowler and Banks (no, they aren't a law firm!) waged a close battle. Blaser again lost it in turn 2, and this sent the field scrabbling. Lett still held the top spot, while Reisbol was in a comfortable 2nd. Killam held his own as the top three turned lap times in the 6.7 to 6.8 range!

At the halfway mark, it was still Lett, Reisbol, Killam, MacGregor and Bowler who were coming up on the back markers as they put Banks, Hamilton, Demory and Blaser a lap down. Positions held up until the 3:30 mark when Reisbol started to go soft and Killam made the move on the back chute and took over 2nd. Still turning some pretty hot laps, Lett and Killam were soon another lap ahead. At the checkered flag, it was Cliff Lett with an impressive wire-to-wire win against some stiff competition. Killam showed well for 2nd and was followed by Reisbol, Bowler (who ran a really clean race) and Joe MacGregor.

When the awards were presented, Dan Moynihan (of Dan's RC Stuff) presented his Sportsmanship Award to Edwin Barr in the Stock Class and John Lignons in

(Continued on page 110)

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WE KNEW IT would be only a matter of time before Mike Walker Sr. produced a vehicle that's worthy of the Twister* name. He has been involved with motor sports for most of his adult life and, with the knowledge gained during years of racing full-scale cars on the West Coast, moving into scale was just a natural progression.

by JIM SHEPKA

storm WARNING!

twister cyclone



CYCLONE CONSTRUCTION

Twister makes it easy for you: the parts for each construction step are packed together in bags that needn't be opened until you reach the appropriate step. With that in mind, I turned my attention to the basic chassis plate and began by filing the battery slots. Instead of using a file, I chose my trusty Dremel tool and worked on each slot so that the batteries fit snugly into place. I also went over all the edges of the chassis just to round off any hard spots, and then I washed off the graphite filings.

The shape of the chassis plate is unique.

PHOTOS BY JIM SHEPKA

Cyclone

Constructed of carbon fiber, it was cut in this configuration to achieve "low polar moment of inertia." What's that, you ask? By putting the vehicle's mass as close to the center axis as possible, the chassis' rolling angle and the amount of weight transferred across it when cornering are reduced.

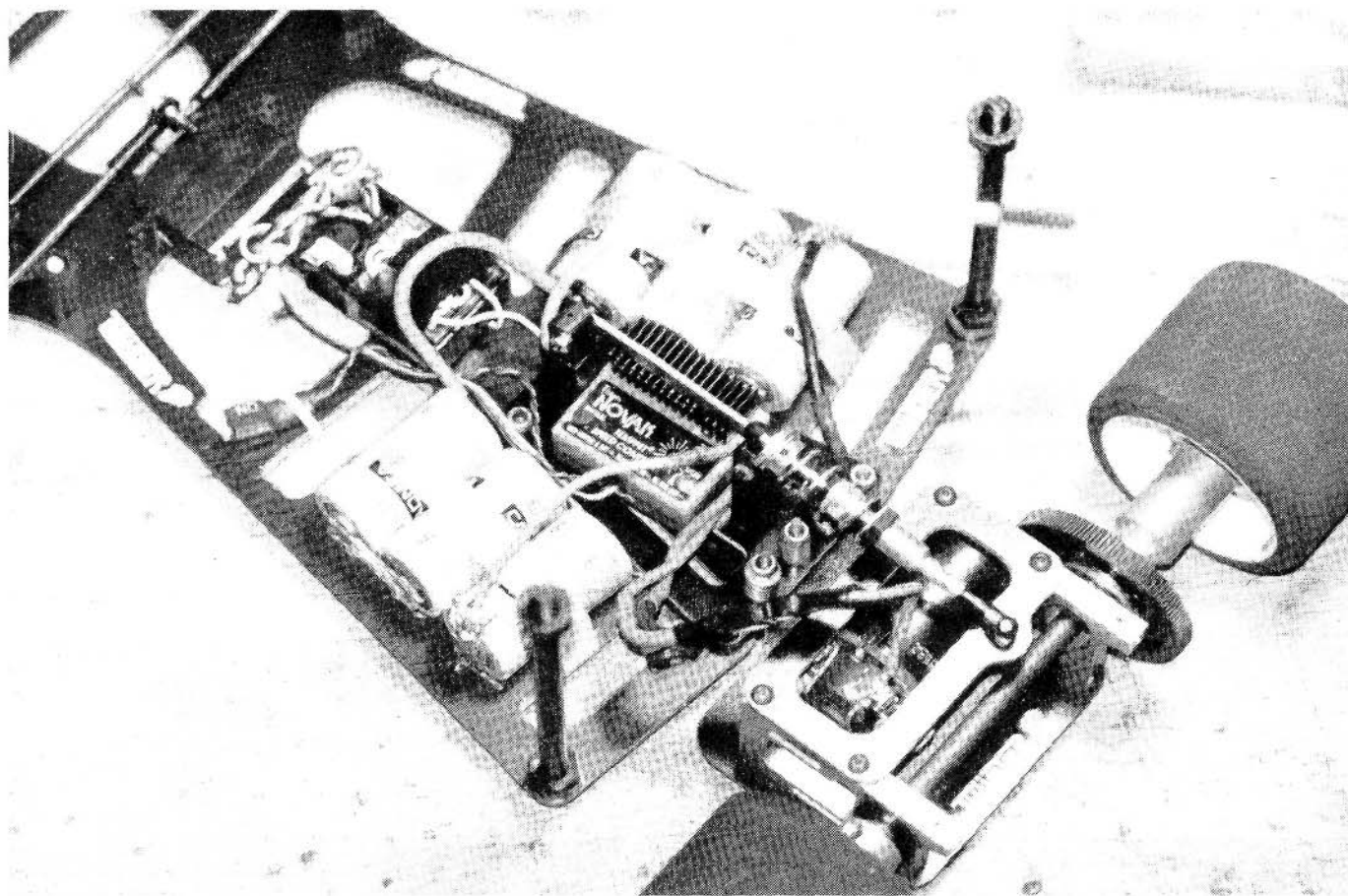
Bag no. 1 contained all the necessary front-end hardware. I inserted the axle through the steering block, attached an E-clip to one end and put a drop of CA on it for increased security. Hav-

so that you can attach the remaining E-clip. (A small pair of needle-nose pliers works nicely here.) Repeat the steps for the other suspension arm. Be patient; it might take a few attempts to get it right.

Now, using the enclosed aluminum screws, attach the suspension arms to the chassis. The screws come in two lengths; the longest one is attached to the middle of the suspension arm. With the appropriate shims in place (they only go in one way!), align the holes and screws,

I emptied the contents of bag no. 2 onto my work tray and looked for the hardware I needed to attach the axle mounts to the T-plate. Using four, 8x32, 1/4-inch screws, I attached both sides and secured them with a dab of thread-locking compound. I noticed that the right side block (motor) didn't sit flush with the bottom of the T-plate, so I filed the excess away. Then, using 4x40 button-head screws, I attached the upper T-plate support to the bulkheads.

Next, I attached the brass



ing completed both sides, I joined the steering blocks to the suspension arms—a job that takes manual dexterity. When you insert the kingpin through the arm, snap an E-clip into place, as shown in the illustration. With the spring and steering block in place, position the kingpin

and tighten all the screws to the same degree. When both sides are secure, construct the front support brace (two plastic rod ends and a threaded rod) and attach it to the two screws that protrude from the tops of the suspension arms. Hold it securely with the supplied nylon nuts.

pivot ball to the T-plate. Insert a 4x40, 1-inch, flat-head screw from the bottom and then put a nylon shim and the ball into place. The ball is threaded, so you don't have to tighten it firmly, but be careful to avoid scratching it.

I moved on to bag no. 3

A Novak T-4 fits nicely under the shock brace. The tweak-adjusting screws are right below the Delta shock.

and began by attaching the rear shock post to the mounting plate. I again used an aluminum, 8x32, 1/4-inch screw. Then I attached the plate to the chassis: I used the 5x40, 1/2-inch, flat-head

cyclone

Type On-road
Scale 1/10
Retail Price \$270

DIMENSIONS:

Overall Length 18.25 inches
Width 8.90 inches
Wheelbase 10.25 inches
Track (l/r) 7.25 inches

WEIGHT:

Gross (race ready) .. 41.9 ounces

BODY:

Type Not included

CHASSIS:

Type Pan
Material Carbon fiber

DRIVE TRAIN:

Primary Pinion/gear
Transmission Direct-drive
Differential Ball
Bearings/Bushings Bearings

SUSPENSION:

Front: Type Nylon suspension arms
Damping Spring-loaded
Rear: Type T-Plate
Damping Oil-filled, coil-over shocks

WHEELS:

Front: Type One-piece plastic
Dimensions (DxW) ... 1.7x1 inches
Rear: Type One-piece plastic
Dimensions (DxW) ... 1.7x2 inches

TIRES:

Front/rear Green-dot foam

ELECTRICS:

Motor Not included
Battery Not included
Speed Controller Not included

OPTIONS AS TESTED:

Futaba PCM radio with S132 servo;
Novak T-4 electronic speed controller;
Twister Blueprinted 12-turn double motor;
Bolin '89 T-Bird Lite body; Bud's bi-level wing.

COMMENTS:

At home on roadcourses as well as ovals, the Twister goes together quickly, has a solid construction and is really fast, right out of the box. The kit should have adjustable rod ends: the rear body posts were too short; but the wing mount is really "trick."

screws and four fiber washers, which I spaced between the plate and the chassis. I then secured the screws with locking nuts. With an X-Acto knife, I removed the sharp edge on the center pivot hole so that the pivot ball would move freely when I installed the T-plate (see the illustration). I inserted two 4x40, 1-inch, flat-head screws into the holes that are adjacent to the pivot ball on the T-plate. Holding the screws in place on the chassis plate from the bottom, I slid small silicone spacers over their tops to hold them and then fit the T-plate to the chassis.

With the chassis and T-plate on a flat surface, I continued the assembly. I put a "tweak" spring collar on both outside screws with the small ends facing upward. I then fitted a tweak spring, attached the remaining collar (with the small end facing downward) and fastened it with 4x40 locknuts. With the tweak screws in place, I slipped a 1/2-inch silicone tube over the center screw and secured it with a 4x40 locknut. (Refer to the diagram for details of the proper adjustment.)

With the T-plate secured at the rear, I mounted the front of the bar to the chassis using one 8x32-inch aluminum screw shimmed by two washers and attached to the antenna mounting post. Washers of various thicknesses produce various degrees of traction, so play it safe for now, and go with the manual's recommendations (one thick; one thin). Avoid over-tightening the nylon screw.

With the shock towers in place, I installed the shock brace between the posts with 2x56, 1/2-inch screws and nuts. Next, I put a drop or two of CA into the top of the rear post, and I inserted a ball cup into the hole with the cup's open side facing the rear of the car.

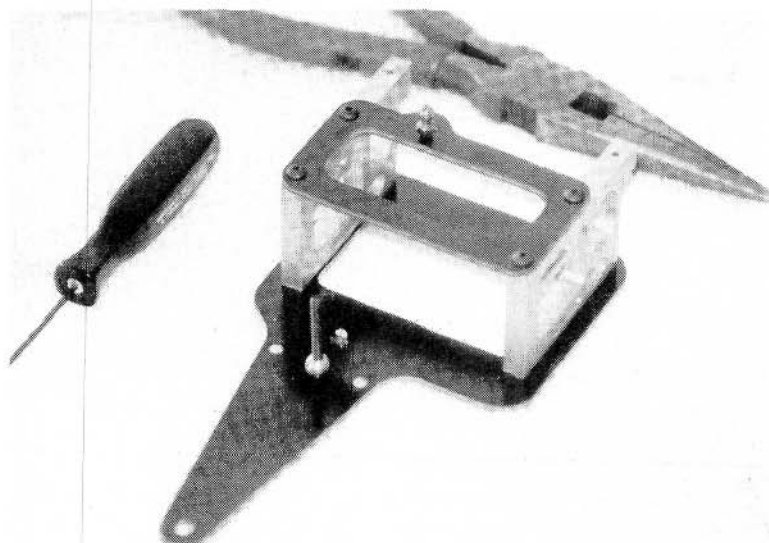
Next, it was time to complete the differential—no big secrets here; just a standard straight-axle design. I'm not a fan of gluing the diff rings in place because of the residue that's left on the axle and hub when you replace them. I can never get the contact point as smooth as I'd like. Instead, I use notched diff rings, and I pin them into place. I drill a small hole in the hub and axle flange and insert a small "pin." The small red plastic tube that comes with motor spray cans works really well here; just trim it to the proper length and put the notched ring into place. This simple technique is effective and a lot less expensive than the available kits.

The kit includes five bearings: two for the axle carriers, one for the spur gear and two for the drive hub. Both

rear hubs and the shock absorber are gold-anodized.

The final step is the construction of a Delta-type shock. I emptied the contents of bag no. 7 onto my parts plate and coated each part with a thin film of oil. I then slid an O-ring, a washer, a small spring and a cap nut over the shock shaft and set it aside. Next, I filled the shock cylinder with 30WT oil (not supplied) and I carefully slid the shaft assembly into the cylinder. To "bleed off" any trapped air, etc., I depressed and released the shaft for each turn of the cap nut. With the cap nut firmly secured, the shaft should move freely in and out. If it doesn't, repeat the process until you're satisfied with the results.

I then attached the rod end to the top of the shaft, slid the spring into place and secured it with the spring adjusting nut. Using a small threaded rod, I attached a ball cap to the opposite end of the shock, and before mounting it, I pumped the shock a few times to make sure it was working effectively. Satisfied with the results, I snapped both ends



The Cyclone's one-piece pod plate and T-plate is a nice feature. The pod will accept either a normal or a reverse-rotation motor, depending on which side you choose to mount the motor.

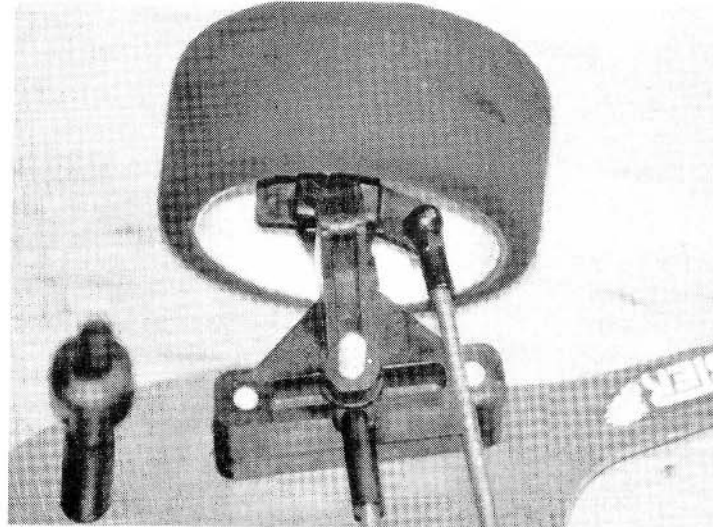
of the ball joint into place.

I chose a Futaba* 132 steering servo, which I attached to the chassis with double-sided tape. (I didn't use servo blocks.) I then mounted a Futaba PCM receiver directly behind the servo, and a Novak* T-4 electronic speed controller fit neatly between the shock supports.

BODY BEAUTIFUL

The kit doesn't come with a body, so I bought an '89 Bolink* T-Bird body. I cleaned it with warm, soapy water and painted the inside completely with automotive-grade masking liquid. When this had dried, I drew the outlines of the numbers and the hood graphics with a felt pen, and then I cut out the designs with an X-Acto knife. You might recognize the design—the "Winston Eagle" logo.

After removing some of the masking, I applied a coat of Pactra's* Candy Blue and then a shot of white. When that had dried, I repeated the process for the numbers, using Neon Red and then white. With that step completed, I removed the re-



Associated-type suspension arms are used up front. Camber shims are placed between the blocks and the chassis, and aluminum screws secure them to the chassis.

maining masking (except for the windows) and shot the entire car with a fine coat of Candy Yellow and then white.

I allowed the car to dry overnight before removing the masking from the windows. To highlight the colors, I outlined the graphics, the window molding, the hood lines, etc., with a fine-point permanent marker, and I finished the scheme with a few decals. I was pleased with the results.

The kit comes with CKW* tires mounted on

dish rims; these are stable while cornering hard and don't become deformed under load. The Twister hub flanges are slightly larger and longer than the usual ones, and this means that the rims can literally be press-fit onto the hubs. This precise fit makes for a drive line that runs very true.

LET'S BLOW!

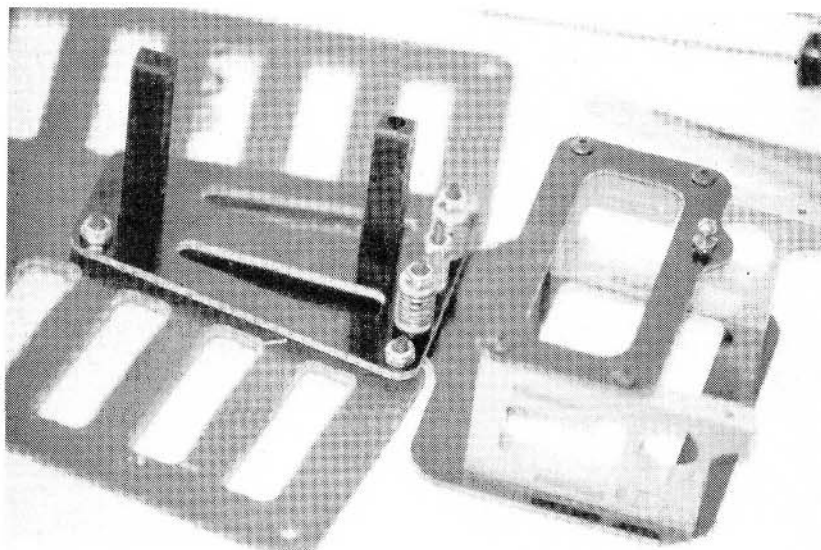
I headed to my local track—Mike's Speedway, Hadley, MA—with a ton of batteries, motors and tires. With the chassis set according to the

manual, greens all around and a stock motor in place, the Cyclone hit the track and was soon blowin' up a storm.

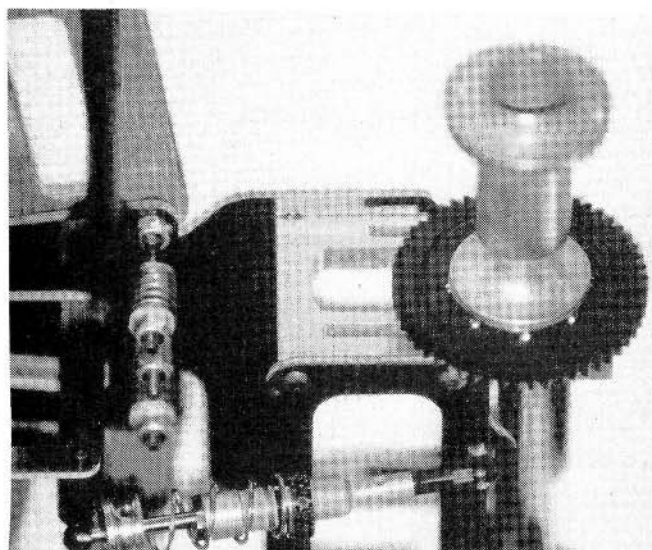
It wasn't too difficult to get the rear end to stick on the high-bite carpet track; in fact, the car started to snap-roll in turns! A switch to a harder front tire (blue) quickly remedied the problem.

In full racing trim, the Cyclone weighed just under the ROAR limit, and a strategically placed quarter bought it up to playing weight. By experimenting with chassis settings, I found that the Cyclone is very responsive to minor changes. By putting a split pack at a variety of locations on either side of the chassis, I really affected cornering. For my racing style, I decided to run the left side batteries all the way to the rear and the right ones all the way forward. This combination worked very effectively on the oval. A slight adjustment of the tweak screws was necessary to balance the chassis for proper handling. With a fresh pack on board, the Cyclone began to turn

(Continued on page 118)



The design of the rear end and T-plate assembly is straightforward. Flexing is controlled by the shock, and side rolling is handled by the spring-loaded tweak screws. Note the two small holes toward the rear of the axle blocks. The wing is mounted directly on the blocks and secured by setscrews on the backs of the blocks.



A longer-than-usual drive hub is used to offset the centered motor. Both the hubs and the shock are gold-anodized.

NERON LAP

COUNTER

by ALEX STROUTHOPOULOS

HAS THIS EVER happened to you?—you leave the drivers' stand knowing that you've lapped the field, but the official lap count has you in 3rd place. Maybe the person counting for you missed a lap, but you can't argue with someone's counting, so you settle for 3rd place and a lower qualifying position in the Mains than you deserve.

**KEEP 'EM
honest!**

At most races, the lap-counting method is a problem. Some officials record each lap on paper or use mechanical hand-counters; others drag their PCs to the track to run a lap-counting program. Some systems use a transponder in the car, but this is expensive.

Recognizing the need for a small, accurate lap counter, the people at Neron Associates* developed the LC-1000—an affordable, self-contained system that's easy to set up and is powered by a 7.2V battery pack (it will run all day on your worst pack). It features:

- a liquid-crystal information display
- a computer with an Intel 80C85 CPU operating at 2.5MHz and 32K of RAM, which is similar to that of a lap-top portable computer
- a screen showing lap readouts, run times, the fastest lap, the scale and the actual mph.

The LC-1000 was designed for one job: to count laps accurately and quickly. It displays the cars' positions in three modes: the first mode shows the top three cars and the countdown timer (you can scroll the display to view the other cars' positions in the heat); the second mode shows the cars in order; and the third mode—"the Delta Mode"—shows the lead car and how many laps down the other cars are in the heat.

Here's an example: car no. 4 is way out front, and car 3 is two laps down. The LC-1000 would show car 4 in the lead and car 3 with a "2" next to it, to show that car 3 is two laps down from the

leader. These features allow the race director to call the race accurately.

When the race is over, a long tone indicates the finish. The LC-1000 then goes into the "Brief Results Mode," in which the final results can be displayed either according to car order or position. The results can be announced quickly from the place/order menu. The car order is used to record information that will later be used to set up the Mains.

With this mode, you can also enter the mph and view the cars' scale and actual mph.

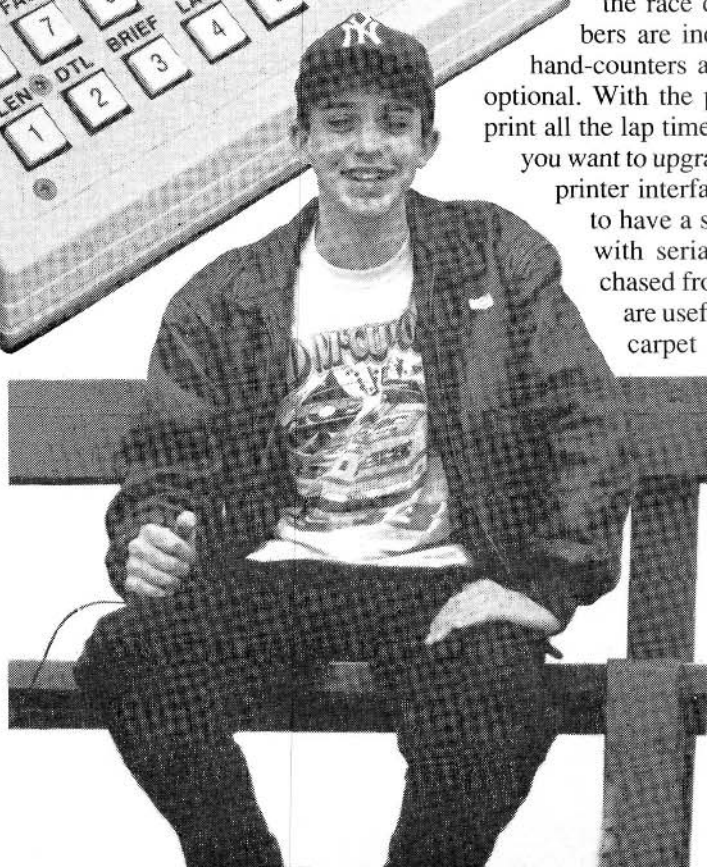
If a dispute arises about the lap count, the LC-1000 has a "Detailed Results Mode" to assess individual lap times. It will tell you whether a car has missed a lap or an extra lap has been awarded. If, for example, an average lap is 18 seconds, and car 3 had two laps in the 9-second range, then an extra lap would have been awarded. Similarly, if a 36-second lap was run, then a lap was missed somewhere (unless the car in question went into the pits for repairs or was stuck in a corner without being marshalled).

Remember, the LC-1000 is a lap-counting system; it doesn't replace the race director. Forms and numbers are included with the unit, and hand-counters and a printer interface are optional. With the printer interface, you can print all the lap times and final heat results. If you want to upgrade your LC-1000 with the printer interface, send it back to Neron to have a serial port fitted. (Systems with serial ports can also be purchased from Neron.) Hand counters are useful, especially on short, fast carpet tracks, or on dirt ovals

where too many fast cars can overwhelm the person trying to keep track of the standings. The LC-1000 is a great addition to any club or track. Its retail price is \$695 (without the upgrade)—a great product at a reasonable price!

**Here's the address of the company featured in this article:*

Neron Associates, P.O. Box 348, Germantown, MD 20875



Tips for your concours creations!

WOULDn'T YOU LIKE TO be able to say that you own a Porsche, or drive a truck exactly like Ivan Stewart's Toyota? What an ego trip! Well, you can!

One of the outstanding aspects of R/C modeling is that you can own a car or truck that looks just like your favorite on the national racing circuit. Not only will your model be a tribute to the full-size vehicle, but you might also win the concours trophy at your next event! This article includes close-ups of some full-scale racing cars (as well as painting and decal tips) to help you achieve that realistic look in miniature.

IT ISN'T EASY!

As modelers, we have a couple of things working against us when it comes to duplicating the real car. First, the clear polycarbonate car bodies we buy aren't exactly to scale. To make the molding possible, or to increase the body's aerodynamics, many small but important details must be eliminated, e.g., the large air scoop on the Toyota GTP. Sometimes what you get doesn't even resemble the car on the package! Most bodies aren't that bad, but few are truly scale.

Second, the details that make a body look realistic can make life tough when it comes to masking and painting. For example, spray painting the inside of the rear fin on a TOJ is like asking for a minor miracle! Most of the time, you try to make the paint trickle down and hope the other colors won't blow in there later.

by MIKE LEE



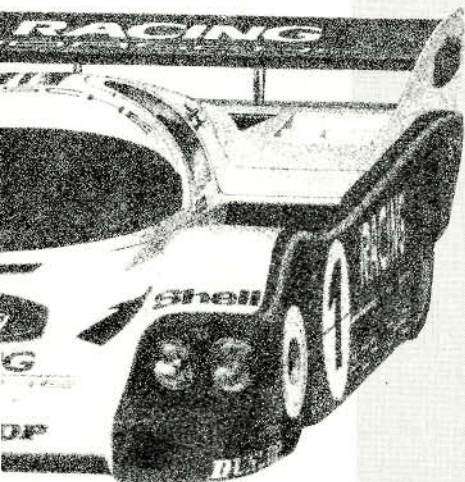
PHOTOS BY MIKE LEE

■ **Top:** Car no. 99 is the Toyota GTP driven by Juan Manuel Fangio for Dan Gurney. This is a great modeling subject: the colors are bright and easy to do; the numbers break up the stripes; and there aren't a lot of sponsor decals. Note the wings over the headlights. Details like these aren't usually molded into bodies, but you can easily make them out of scrap Lexan.

■ **Above:** Car no. 67—a Nissan GTP-ZX driven by John Paul Jr.—isn't factory-sponsored, but it has an impressive paint job.

GTP

DETAILING



■ Nissan's success in recent years has made the GTP-ZX Turbo one of the "most wanted" cars in racing. These late-1990 models are sleeker than the previous ones. Small details like fuel caps and vents really make your model look realistic. ▶

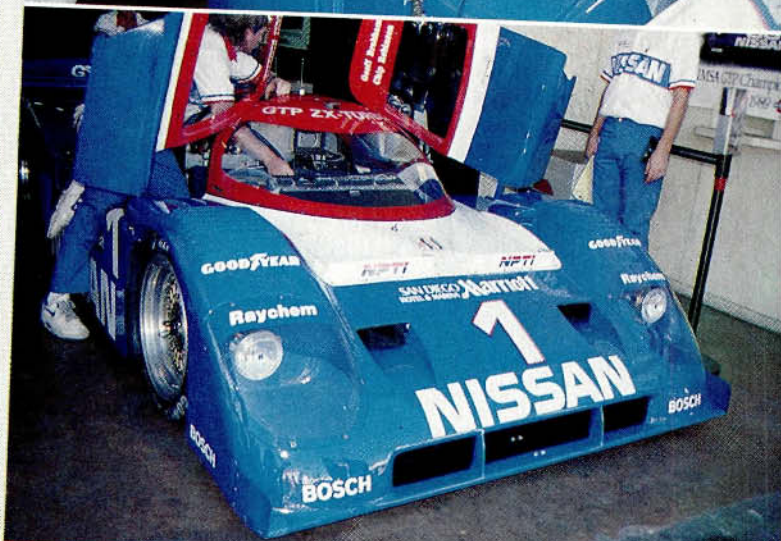


■ The Porsche 962-C is still one of the best-looking cars in GTP racing. James Weaver's is one of the last on the circuit.

HELPFUL HINTS

Replicating real cars in scale is no picnic, but these tips should help you:

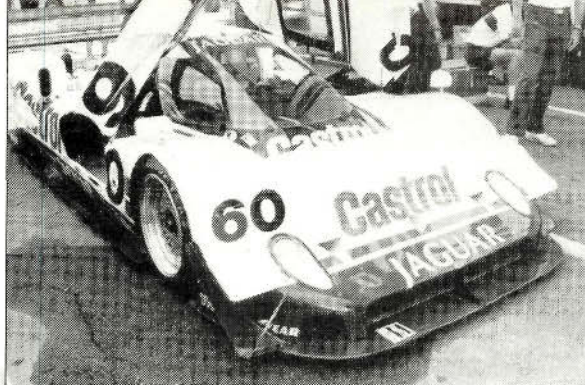
- Before you choose a paint scheme for your car, look at pictures of the "real thing" for inspiration. You'll find that most full-size race cars don't have elaborate paint schemes, for the same reason that R/C cars don't: the bodies won't last all season! The GTP cars seen in 1990 IMSA-sanctioned races are very popular and make excellent modeling subjects (see photos).



GTP

■ *Concours judges look for small details like wing mounts, ground effects and intake scoops. Note the multi-element wing and the rivets used to fasten parts to the body.*

DETAILING



IS IT DONE YET?!

After you've taken all the masking off the body, you can sit back and admire your masterpiece! What's this? It doesn't look right—a bit dull and lackluster? Don't worry—it simply lacks the decals, numbers, details and lettering; they're what you need to complete the look. Again, by studying pictures of the full-size cars, you can find out which decals to use and where to place them.

In our examples, you'll notice that the GTP cars have few decals compared with stock cars on the Winston Cup circuit, but the ones they do have are large!

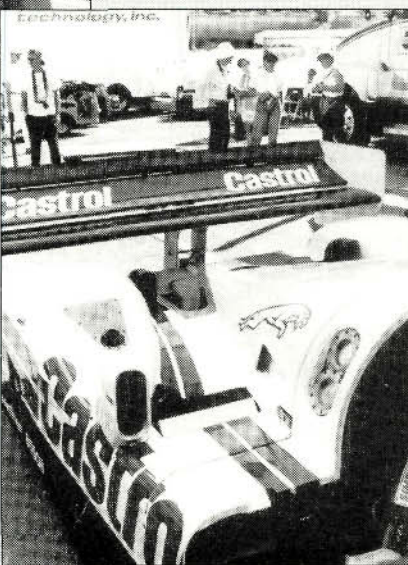
The same holds true for Formula 1 cars.

Decal placement is critical. Most big-time racing teams want their cars to look appealing, and they want to ensure that people can see the decals. After all, the sponsors want the public to know that a race car made it to the winners' circle using *their* product.

Unlike the sleek CART Indy cars, GTP cars have many small details, and R/C concours judges might make your car the one that wins the 1st-place trophy.

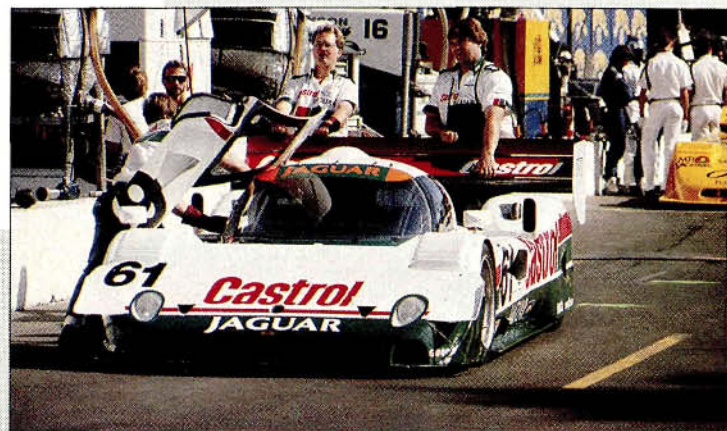
To add the finishing touch, you can accent your car's body with detail lines. I use a technical pen with black India ink for panel or door lines. Headlights add to the look, as do a well-painted driver and cockpit. BBS-style wheels make the sides of the car look professional, while numbers of the correct style and size can really set off the front and top.

With a little effort, you can have a



■ *The Castrol/Jaguar XJR-10 is one of the most attractive GTP cars and a favorite of model car enthusiasts. The colors aren't difficult to reproduce, but the decals might be tough to find in the proper size. Note that the sponsor logo breaks up the side stripes.*

realistic-looking model that you can race without fear of damaging it. Most paint schemes aren't difficult to duplicate, and these hints and a close look at the full-size car should help you get the details exactly right. After all, we're racing real cars, aren't we?! ■



• The paint scheme is much easier to identify if you ignore the decals and numbers. Some areas on NASCAR-type cars are practically covered with decals!—but remove them, and cars like Bill Elliott's

Thunderbird are no longer difficult to paint (it has three basic colors; the rest is decals, numbers and lettering). The Sauber Mercedes Class C car that won the 24 hours of LeMans and even Rick Mears' Pennzoil Penske car are each one color underneath (silver and yellow, respectively).

• To simplify the job of masking your model, it might help to draw the color scheme. This will help you to see where to apply masking to separate the color areas. Again, without the clutter of the decals, this job is much easier. Once you've chosen a paint scheme and figured out how to do it, prepare the body to be painted.

• To do a great paint job, be sure to clean the inside of the body before (and after) masking. To ensure a clean, sharp cut line and to prevent paint bleed, I use plastic pin-striping tape for the edges of my masking line. When the color scheme calls for pinstripes, you can apply striping tape to the outside of the body. I often use a pinstriping tape that's the color of the final stripe and leave it in place after painting. (It stays on better inside the car than outside.)

• Remember to mask the body fully to prevent overspray from hitting the outside, and make sure that the masking lines are applied securely. Don't use a lot of paint—just enough to cover the plastic completely and evenly—and let the body dry completely before handling it. (Paints usually take overnight to harden.)

HOME-BUILT PROJECT:



THE BLACKFOOT ROCKS ON!

by JOHN HUBER

MONSTER TRUCK racing has become one of the most popular facets of R/C, and today, many new trucks have all sorts of "trick" parts. How did this craze start? Many R/Cers (including me) were introduced to monster trucks with Tamiya's* Blackfoot or Monster Beetle. Although these trucks don't have a composite chassis or a state-of-the-art transmission, they're still a lot of fun. This month, I look at the home-built project of Chad Hardy (of Decatur, IL) and the improvements he made to his Blackfoot.

Chad wanted a more stable, faster Blackfoot, but he didn't want to spend a bundle, so rather than spend his

money on a belt-drive system, he used the stock gearbox, which worked well. (Even if he had to replace the stock gears, he knew they'd be inexpensive.)

Chad did, however, have a problem with the stock dogbones. This is an ongoing problem with the Blackfoot and one with which I'm familiar. The hex heads on the dogbones become rounded after a short time. (If you use a modified motor, they'll wear even faster.) Chad's remedy? He installed a set of CRP* dogbones made of graphite-reinforced nylon. They cost only a couple of bucks, and they're much more durable.

Anyone who owns a Blackfoot knows that because the stock suspen-

HOME-BUILT PROJECT:

Here's a perfect example of the paint job that's possible with a polycarbonate body. Chad's friend, Brian, must have spent a lot of time painting this one! With a custom-painted body, a Custom Chrome chassis and Sees aluminum rims, this is one classy Blackfoot!

The adjustable platinum front shocks are mounted upside-down on the JG shock towers. While this is unusual, any air inside the shock will be near the start of the compression stroke rather than at the end, and this will prevent softening of the suspension at full compression.



Chad's radio system consists of a Futaba Magnum Jr. with a Novak T-1 speed controller. JG shock mounts provide a much sturdier mount for the body, and they're less likely to shear off after a rollover.



The CRP dogbones are inexpensive, effective after-market parts that will outlast the weak stock parts.



PHOTOS BY YAMIL SUEO

sion has no damping, it has too much bounce. To keep all four tires on the ground, Chad used a set of JG* shock mounts and Kyosho* Platinum shocks. To increase travel and body lift, he installed long shocks on the front and rear. By adjusting the spring tension, the ride height is set to keep the dogbones parallel with the axles, and this reduces wear.

Chad chose one of the most popular radios—a

Chad added a Custom Chrome* chassis. He dyed the shock towers and the nylon parts a deep red, and he polished all the aluminum chassis components. The Sees*

directional rims with JG diamond-spoke tires look great and perform well.

Chad wanted a perfect paint scheme, so he turned that job over to his good friend Brian Oyler. The result was a wild, wavy paint job that's sure to turn some heads. Nice job, Brian!

I hope that Chad's ideas will help you turn your Blackfoot into a work of art. He thanks his father for his help in the pits and his friends, Corey and Rod, for their enthusiastic assistance. Keep up the good work, guys.

*Here are the addresses of the companies mentioned in this article:

MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.

CRP, 8784 Plata Ln., Atascadero, CA 93422.

JG Mfg., P.O. Box 6014, Whittier, CA 90609.

Kyosho/GPM Dist., P.O. Box 4021, Champaign, IL 61824.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Novak Electronics, 128-C E. Dyer Rd., Santa Ana, CA 92707.

Wimpy, distributed by AKS, 418 Roberts Rd., Chesterton, IN 46304.

Custom Chrome Parts, 36175 Plymouth Rd., Livonia, MI 48150.

Sees Precision Machine Works, 1414 W 134 St., Gardena, CA 90249.

Parts List . . .

CCP chrome chassis

CRP graphite dogbones

Futaba Magnum Jr. radio

JG front and rear shock towers

JG diamond-spoke tires

Kyosho Platinum shocks

Novak T-1 speed controller

Sees directional-spoke rims

Trinity matched SCR Sanyos

Wimpy modified motor

Futaba* Magnum Jr. A standard S28 servo might not give you the fastest speeds, but it's strong enough to survive most off-road abuse. A Novak* T-1 supplies the power to a Wimpy* motor, which is anything but wimpy! A CRP* adjustable motor mount allows for a greater variety of gear ratios so that the car can be properly geared for a given track.

DIRT DIGEST

by BILL O'BRIEN AND BOB KANE

Bad Brain's fun break

I WAS HARD AT work on a Bullhead modification (you know; another month, another fifty cents!), and wham!—I turned around and was hit in the head by the "Dirt Digest" deadline. I had to stop having fun with the Bullhead so that I could start having fun with other projects—what a life!

R/C companies have been bombarding me with notes and messages about new products, so let's get some of them out of the way.

PRO-LINE

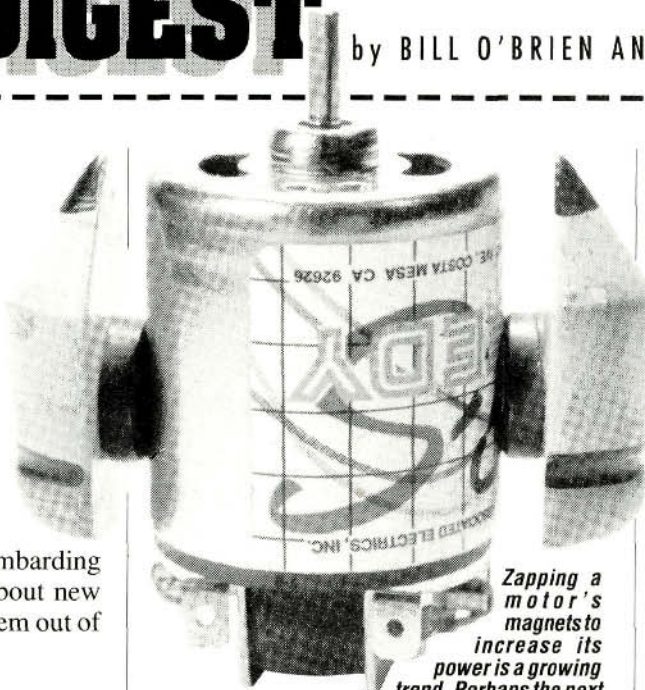
You won't see the 7070 Red truck tires in Pro-Line's* new catalogue. (It would be easy to say that Pro-Line forgot to include them, but the truth is the tires were introduced after the catalogue was published.) I like this series of tires because you can mount them on 2-inch rims as well as on the more common 2.2-inch ones.

The 7070 is one of the oddest tires you'll ever see (its surface has spikes, bars and waffles). In fact, it's probably the closest thing to an all-terrain tire for 1/10-scale that has ever been produced. Although this tire doesn't look as if it would do well on either very low- or very high-traction surfaces, all the tracks that fall in the middle (e.g. sandlots, backyards, baseball fields, etc.) should be good places to test it.

CLOD LIFTERS

After condemning APM's* tilt-hood kit because it had poor documentation, I'm pleased to announce that the instructions have been rewritten (they're actually easy to follow!) and illustrations have been included. You have to do the same amount of work, but now you know *what* you're supposed to do.

APM also sent me information about its new, 10-piece Clod Suspension Lift kit. Because I receive information on hundreds of new products each month, I might have overlooked it, but APM thought of



Zapping a motor's magnets to increase its power is a growing trend. Perhaps the next power-augmentation technique will be to attach kitchen magnets to the motor can's sides. (Decorator styles are available!)

something that never occurred to me. (When that happens, I stand up and take notice. After all, it's widely recognized that I know everything, or at least I always hear people say, "That Bad Brain—he's a know-it-all," which is the same thing, isn't it?)

Using a lift kit to modify the Clod (or mounting the shocks in the lower mounting holes on an aluminum chassis) doesn't affect the way the ladder bars work, but it often causes the suspension braces (which run from the differential cover to the chassis' bottom) to pop off after a few hard jolts. APM found a simple solution. Its lift kit includes four extra-long ball links that are installed on the chassis' bottom and lower the attachment points. APM did a good job of solving a problem that I hadn't even ragged about yet!

ALUMINUM CHASSIS

Do you remember all the hoopla about graphite chassis being electrical conductors that can cause your radio

Pro-Line's new tire has a distinctive tread pattern that should be able to handle most poor-traction conditions. It has spikes, bars and waffles—what more do you need?

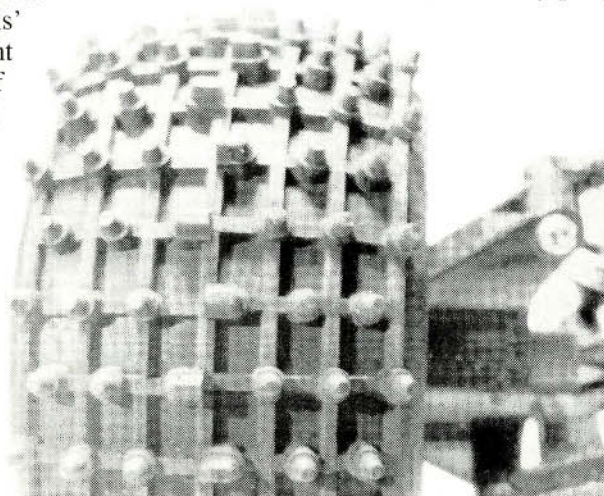
equipment to short out? Well, aluminum chassis are even better at conducting electricity! Despite this, aluminum chassis are here to stay. They're less expensive than graphite ones, and if they're damaged, you can bang them back into shape. Just remember that they conduct electricity, and you must take the same precautions as you would with graphite (e.g., sand down all sharp edges, use grommets when you run wires through holes in the chassis, etc.). If you don't, you might be *shocked* by the results!

MAGNETISM

When I was in grammar school (during the Stone Age!), my science teacher, Sister Veronica Voltage, told us to bring a 1.5V dry battery, some wire and a nail to class. We wrapped the wire around the nail and then connected the wire to the battery. When current flowed through the wire, the nail became a temporary electromagnet, and anything metal that came in contact with it became temporarily magnetic, too. (Be careful if you try this experiment. The magnet generates a lot of heat, and the nail quickly becomes hot.) So, if you ever need a magnetic screwdriver and don't have one handy, just rest a screwdriver's blade on your motor and, in less than a minute, it will become temporarily magnetic.

Motor zappers work in almost the same way. The zapper generates a magnetic field using two electromagnets, and when

(Continued on page 98)

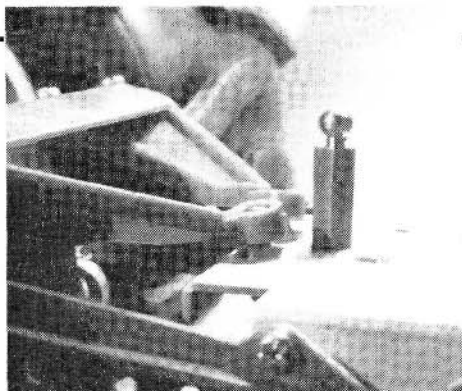


you put a motor between them, it becomes magnetic, too. (Notice that I didn't say, "the motor's magnets become magnetic." When you zap a motor, *everything* is affected: the magnets, the can and the armature. This doesn't damage anything and, like any induced magnetic field, it's temporary.)

Although no one has done any conclusive testing yet, zapping a motor seems to give it more power. This is because a zapped motor can and everything inside it produce a magnetic field, whereas before, only the magnets (which are permanently magnetized) and the armature wires (which have a magnetic field around them caused by the current flowing through them) produced a magnetic field.

INSPECTED CONNECTOR

A long time ago, in a laboratory far, far away, my friend Charlie sat hunched over a workbench, soldering connectors. Because they were Tamiya* battery connectors and bullet-style motor connectors, which are usually crimped on, I thought he was crazy. Why would he go to the trouble of soldering them? Well, Charlie muttered something about "air gaps" and said that no two surfaces are flat



Raising the chassis doesn't raise the suspension braces. APM's extra-long ball links provide the clearance that's necessary for smooth, reliable operation.

enough to completely butt against each other, even if you apply a lot of pressure. He said that there are always air gaps in electrical connections, and that voltage doesn't like to jump across air.

Charlie continued to solder his connectors, and I just shrugged and continued to crimp mine. Although our cars were equally fast, his Thundershot always had slightly longer run times (by at least 30 seconds and sometimes 1 minute!) than my Optima Mid. I might be crazy, but I'm not stupid! I started to solder my connectors, too, and that evened out our run times. (Actually, I was faster, but that makes it even, right?)

NEXT MONTH

That's all for now. I figure that by the time you get the books you'll need to check out what I've written about this month, it will be time for next month's column, in which I'll astound you with some electrical stuff. (No, I'm not John Rist. I gave up on oscilloscopes after I generated a cat's-eye pattern on one, and it watched me when I walked across the room—scary stuff!) There's a promising new generation of batteries called nickel-hydrate cells. Would you believe an AA-size battery with a 1200mAh life? Or what about an AA/F-size battery that puts out 2300mAh? Imagine what sub-C cells could do! These batteries require special attention and they don't tolerate much abuse.

Until then, I'll be waiting for you. (If you don't believe it, turn the page and quickly turn it back again—see? I'm still here!) Next time, dudes.

**Here are the addresses of the companies mentioned in this article:*

Pro-Line U.S.A., P.O. Box 456, Beaumont, CA 92223.

APM Custom Hobby, Inc., P.O. Box 357, Dumont, NJ 07628.

MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.

RADICAL RACING



CAR KITS

RC-10	\$119.95
RC-10 Graphite	139.95
JRX2	149.50
JRX PRO	159.50
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Lynx II Elite	164.95
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Novak 410 MXC (w/tork adj.)	119.99
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Tekin ESC 310 (w/tork adj.)	65.95
Tekin ESC 610 (w/tork adj.)	89.95
Tekin ESC 700 (w/tork adj.)	118.95
Tekin ESC 411 (w/tork adj.)	104.95
Tekin ESC 600	99.99
Tekin ERM 80 (reverse module)	39.95

MOTORS

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Fantom 10T thru 19T	43.99
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East Coast 11T thru 18T	43.99

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Race Prep 14D-17S	24.99
Ace Pilot 13T-15T-19T	32.99

Stocks

Race Prep	\$16.99
Revteck	16.99
Cam Pro	16.99
Joel Johnson	16.99

BATTERIES

Trinity (pushed) 6 cell SCR	\$49.99
Trinity (pushed) 6 cell SCE	53.99
Trinity (pushed) 7 cell SCE	62.99
Cam, 6 cell SCR	31.99
Cam, 7 cell SCE	39.96
Sanyo, 6 cell SCR stick	19.99

CHARGERS

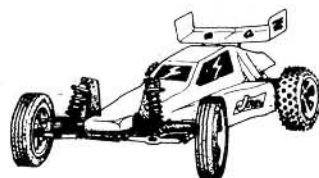
Turbocharger (pulse)	\$199.95
Turbocharger (linear)	214.95
Tekin BC 100L (linear)	64.95
Tekin BC 210 (reflex)	119.95

HOP UP PARTS

A&L Lethal Weapon RC-10	\$81.99
A&L Lethal Weapon Ultima	83.99
A&L Power CLutch JRX2	25.99
A&L Power Clutch MIP & A&L	23.49
MIP SP-1 HD	83.99
10L LTO Graphite	23.99
10L Graphite	23.99
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Lynx II LTO Graphite	26.99
RRP 5000 Blackfoot Diff.	47.99
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RRP King Cab Spur Adapter	8.99
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81-85-87-90	10.99

Parts Available for Most Popular Cars

CALL FOR DETAILS



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931 BBS Green Front	9.99
932 BBS Yellow Front	9.99
1030 BBS Blue Rear	10.99
1031 BBS Green Rear	10.99
1032 BBS Yellow Rear	10.99
1430 Nascar Blue Front	9.97
1431 Nascar Green Front	9.97
1432 Nascar Yellow Front	9.97
1530 Nascar Blue Rear	10.97
1531 Nascar Green Rear	10.97
1532 Nascar Yellow Rear	10.97
936 Yokomo Front	11.99
1036 Yokomo Rear	14.97

P R O J E C T

VILLAIN

by GERRY YARRISH



Above: The Villain hops right up on plane and accelerates quickly. When rudder travel had been toned down, turns were smooth and positive. Left: The author remembers the meaning of, "Always come prepared!" Brrrrrr!



Kodachrome
FILM

Kodak
PROCESSING SERVICES

SPECIFICATIONS

Type: Deep-vee

Length: 32 inches
(including outdrive)

Beam: 8 inches

Weight: 3³/₄ pounds (without batteries)

Hull Material: ABS plastic

Power Req'd: Dual 550, geared stock motors

Batteries: Two 6- or 7-cell 1200A packs

No. of Channels Req'd: 2 (throttle and rudder)

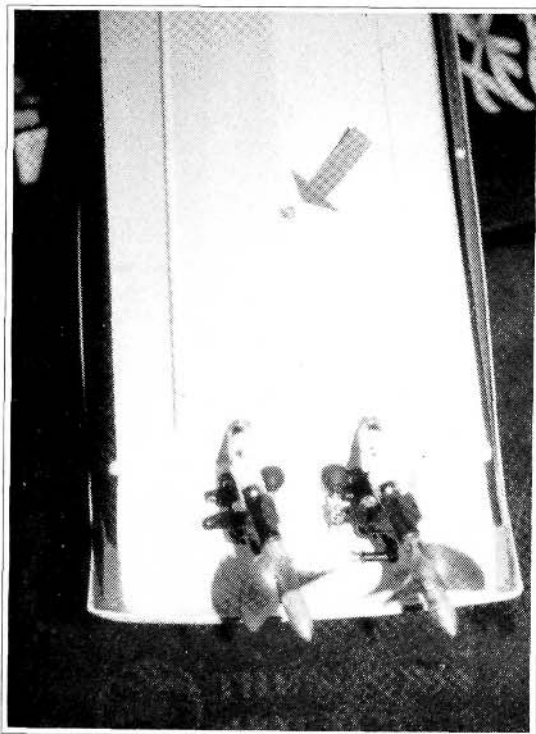
Sug. Retail Price: \$185

Features: the Villain has two adjustable, surface-piercing outdrives. Model no. 1508 comes ready to run with a 2-stick radio and a Traxxas XL-1 electronic speed controller. It has a detachable, metal, whip antenna and a rubber, waterproof switch boot that allows the main hatch to be removed easily without disconnecting any wiring.

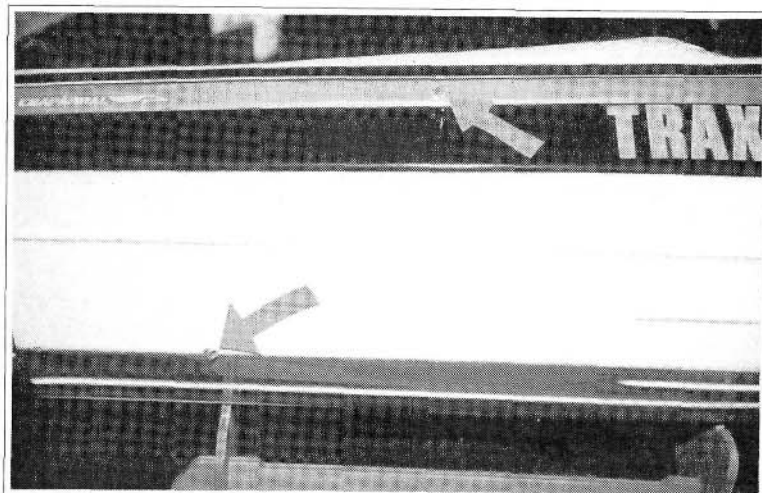
FIRST saw the Traxxas* Villain at a trade show, and I was impressed that a company would offer a truly fully assembled, fast electric boat. The Villain IV is not only ready to run (radio installed), but it also includes twin RS-540S motors and dual outdrives. Add two 6-cell Ni-Cd packs and you're ready for the waves.

THE MODEL

The Traxxas Villain IV is a good 1/12-scale reproduction of the full-size Chaparral boat, and you could easily dress it up for scale contests. The hull is a traditional, stable deep-vee, which handles most reasonable water conditions. Like the Chaparral, the model has twin, counter-rotating outdrives and universals that rob the system of very little



Right: The twin surface drive. The universals rob the motor of very little power while in the turns. Note the counter-rotating props.



Above: The arrows show the water inlet and outlet tubes. The inlet is at the bottom of the vee hull, and water-cooling is very efficient.

power while the boat is turning.

The standard kit (no. 1508) includes the Traxxas XL-1 electronic speed controller and a complete, Traxxas, high-power, two-stick 2-channel radio. Traxxas warns that this product isn't a toy and requires adult supervision when it's run by a child. The dual outdrives' exposed propellers are

potentially dangerous.

TRAXXAS TERROR

My test boat was a hopped-up version, but a stock version could easily be modified. Out of the box, the stock configuration is capable of 14mph, and to boost it into the 18 to 22mph category, you only need some low-buck additions (see the list of optional parts).

drill the plastic motor-mount brackets to accept the larger tubes. This might sound complicated, but it isn't, and when Traxxas used radar to check the speed of a boat with this setup and 14 cells, they clocked it at 26mph! I was therefore sure that the time I spent on this mod would be worthwhile.

A stock Villain IV package lists for about \$185



and can be found at

most outlets for about \$120. You could build a 25mph Villain for approximately \$250 and give competitors a real run for their money. A PDI* Hydro Zeta Xtra speed controller would give you the ultimate setup package. To economize, you could substitute two Octura* 1245 props for the Octura X447 props; they're the best all-around props and run at only about 3mph less. Any way you go, the road to the winners' circle won't lead you to the poorhouse.

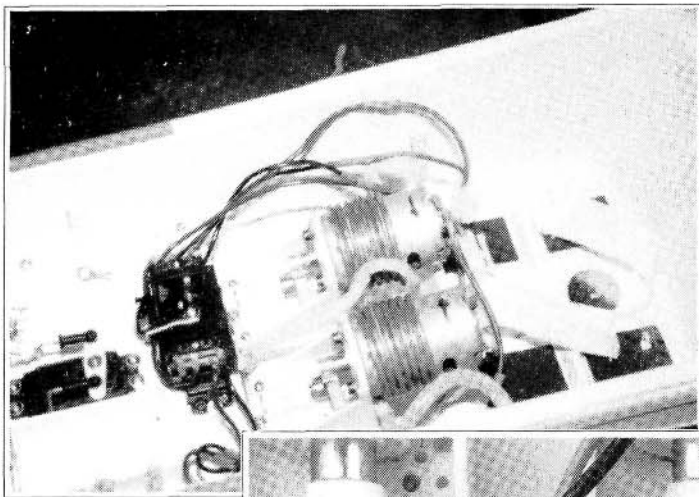
THE TEST

On a sunny, though chilly, November morning, I loaded up the Villain and headed to the lake with a bag of freshly charged Trinity* SCR 6-cell battery packs. The wind was blowing a little more than I liked, but this was my last chance to test the Villain before winter, so I decided to go for it.

I put the boat in the water, motored it away from the

(Continued on page 104)

TRAXXAS VILLAIN



Left: The interior Villain—neat and easily accessible. Note the cooling tubes wrapped around the stock motors.

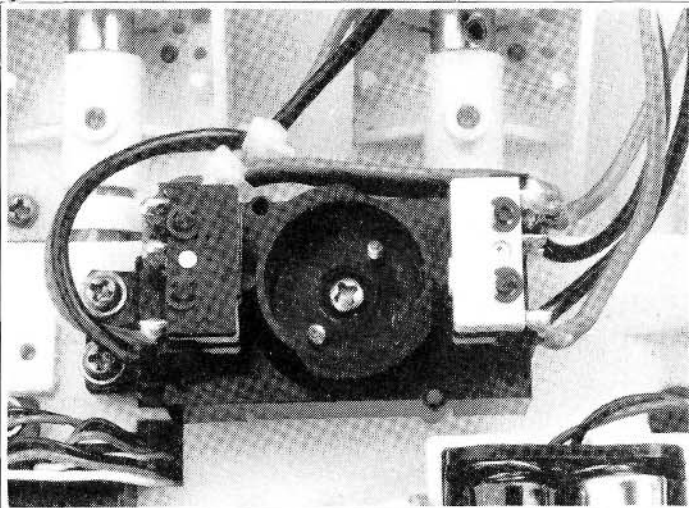
dock and then punched it! In no time, the Villain was up on plane and going like a demon. In the first turn, it spun out. The steering was very positive and had to be toned down to avoid spin-outs in rough water. The new Traxxas 2-channel pistol-grip transmitter has dual-rate features, so I dialed-in a little less rudder throw and tried again. This time, turning was much more under control, so I made three or four more passes. The deep-vee hull is perfect for rough water, and the Villain handled the waves well, until....

TRAXXAS TERROR!

No one can accuse me of playing it safe when I test products. I always try to push models to their limits, but in this test, I went one step beyond! On the last turn, I accelerated fast into the straightaway and hit a wave just hard enough to throw the model sideways and turn it over! Dag nab it!—and me with no rescue boat! I stood quietly, wondering what to do next.

The wind was blowing the model away quickly, and it was too cold to swim for it. Then the Villain sank at one end—only its bow was facing skyward. This wasn't a good sign! The Villain was also drifting away from the public part of the lake and into private waters.

I jumped into my car and sped toward the neighboring private-beach commu-



Close-up of the microswitch speed controller, which has two forward speeds but no reverse.

nity. At the first house, a little old lady wasn't impressed when I said I was an associate editor of *R/C Boat Modeler* trying to retrieve a model boat. I eventually gained access to the private beach, and there, way off in the distance, was the diminishing silhouette of the hull just barely afloat—but slowing heading my way!

If only I had taken my own advice and come prepared with a small retrieval boat or a fishing pole! Instead, I knew I faced a frigid November swim—with an amused audience! Yikes! That water was cold! I went out about 30 feet and reached the boat just before it went down for the count. Thank heavens, the boat has a big sealed flotation area in its bow. My pride was saved. (I've never lost a boat!)

CLEARING THE BILGES

After a soggy ride home, I worked quickly to minimize the damage. I removed and disassembled the batteries, receiver, servos and motors. I used compressed air to blow-dry all the parts, and then I put them in the sun to evaporate any remaining moisture.

VILLAINOUS HOP-UP OPTIONS

2—Octura 1245 props	\$1.80
2—Octura OCGCSS Villain prop shafts	\$7.90
1—Graupner* 3966 speed controller	\$35.80
Total	\$45.50

For even more speed, try these:

Ball bearings	
4—4x8mm flanged bearings	\$9.95
4—4x8mm bearings	\$9.95
1 piece of 1/32-inch brass tubing	\$1.00
8—4mm shim washers	\$1.00
Total	\$21.90

Motors

2—stock 550 motors @ \$18.50 each	\$37.00
2—16-tooth pinion gears	\$2.00
Total	\$39.00

Props

2—Octura X447 props	\$28.00
---------------------	---------

When I removed the back of the receiver, I was pleased to find that the electronics had been factory-sealed with wax and were therefore waterproof—a nice feature for a nautical radio. I peak-charged the batteries, and they seemed to be fine.

What about the motors? I doused them with electric motor cleaner to displace the water, and when the cleaner had evaporated, I ran the motors on a low voltage. Whew!—no obvious damage. The only thing I had to do was enlarge a drain hole so that I could pour out all the water (about a gallon!). I only lost the two wing nuts that held down the hatch. Had the Villain sunk in salt water, my story wouldn't have ended so happily.

SUMMARY

The Traxxas Villain IV is a very fast, well-controlled, deep-vee hull that will get you on the water in the shortest possible time and will perform well in all but the most severe conditions. Its design features a "dead-air" flotation area in the bow, and this saved the day when the model capsized. With its twin, water-cooled motors, it's one of the fastest out-of-the-box models I've tested, and despite my cold lake dip, I had a great time with it.

*Here are the addresses of the companies mentioned in this article:

Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228.

PDI, 16922 N.E. 124th St., Redmond, WA 98052.

Octura Models, 7351 N. Hamlin Ave., Skokie, IL 60076.

Trinity, 1901 E. Linden Ave., # 8, Linden, NJ 07036.

Graupner; distributed by Hobby Lobby International, 5614 Franklin Pike Cr., Brentwood, TN 37027.

SCOPING OUT

by JOHN RIST

PDI's Zeta Xtra



THIS MONTH, I check out the PDI* Zeta Xtra, which has proven to be a tough competitor in an Open II Class pulling rig (with 28 cells and multiple motors). In fact, the Xtra was the grand winner of the speed controller shootout presented in *R/C Car Action's 1991 Monster & Racing Trucks* special issue.

The Zeta Xtra is big, but it will fit into many 1/10-scale cars and trucks. The reason for its wide range of applications is its 6- to 36-cell rating (most controllers have an 8-cell limit). The Zeta Xtra has these features:

- forward-only design for high voltage and high current
 - 9 FETs for a very low "on" resistance
 - 6- to 36-cell capacity
 - an internal microcomputer that allows full programmability
 - a sealed case that's truly immune to water, mud and dirt
- It comes complete with an instruction book, a hand-held programmer, filter capacitors, Zeta decals and a Velcro® mounting system.

IT'S PROGRAMMABLE

Zeta controllers are in a class of their own. They're the only ones with a

microprocessor chip that permits you to program various functions, such as throttle-response curves and acceleration rates. You can also set the neutral and full-throttle points by using the hand-held programmer.

All this is both good and bad: because of its programmability, the Zeta is the most versatile speed controller (SC) on the market, but it's also one of the hardest to set up. I don't mean to imply that the Zeta is impossible to use, because it isn't, but its setup is very different, and understanding its features requires several careful readings of the instruction book.

Once matched to your transmitter, the Xtra doesn't require adjustment. With time—and racing experience—you'll learn which trigger and acceleration curves work best, and then you can reprogram the controller. I suspect, for instance, that the C6 throttle curve might work well for truck pulling. This curve spreads about 40 percent of the throttle over the first 70 percent of the trigger travel. This gives you precise throttle control when you're trying to get hooked-up and start a sled moving. Then, in the final 30 percent of the

trigger travel, the controller comes on hard and fast to give you the explosion of power that's required to take the sled the full distance. (The instruction book suggests curves for particular conditions.)

CHECKING IT OUT

It's a crime to pry the lid off a Zeta speed controller, but in the interests of investigative reporting, I did it! The Xtra's case is truly watertight. All the small wires (receiver cable, on/off switch, etc.) pass through it sealed in watertight, soft-rubber plugs. This arrangement protects the wires from breaking, but it also makes them very difficult to replace if they are damaged.

The Zeta Xtra is built out of a solid aluminum block, the center of which has been machined out to make room

THE "SCOPING OUT" LAB

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V, 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors, which can be switched on and off one at a time to vary the load between .6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current meter's reading can be double-checked. Of course, the lab power supply provides the test current.

THE CHOICE OF WORLD CHAMPIONS

for the parts. The walls are $\frac{1}{8}$ inch thick, and the nine FETs that handle the power are bonded to them to ensure a direct path out for heat. Also bonded to the case is a large clamping diode that's used to control voltage spikes.

To ensure a low "on" resistance, the main battery and motor wires are soldered to the ends of monstrous, 12-gauge buss wires that pass through holes in the case that are insulated and sealed against water and dirt with grommets. These massive wires loop around under the printed-circuit (pc) board and are soldered directly to the FET leads. With this method, PDI avoids passing motor current through the flimsy, power-robbing etch of a pc board.

An inspection of the Zeta Xtra's innards revealed that this controller is about as small as it can be. The cavity under the lid is crammed with a miniature battery, an oscillator crystal, an auxiliary pc board (which holds the parts that wouldn't fit on the main board) and a packet of moisture-absorbing material. (This is necessary to absorb any moisture that gets trapped in the controller when the case is sealed shut.)

LAB TESTS

It was time to see whether the Zeta Xtra had more to offer than just good looks, so I bolted the lid firmly back into place, and I went off to the lab.

In the pulling-truck controller shootout, the Zeta Xtra was tested at higher levels than I usually use for "Scoping Out," and it handled them without a problem. The tests were carried out in the familiar three stages, but I added a few torture items to my "Scoping Out" lab, e.g., a 12V car battery (for the voltage-drop and "let-it-cook" tests) and four, 7-cell packs, which I intended to destroy in the

(Continued on page 108)

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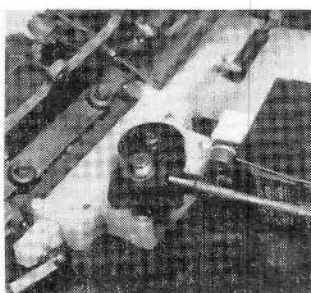


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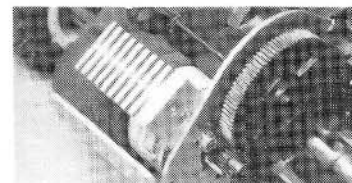
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100A dead-short test.

To provide the dead short necessary to get 100 amps out of a Ni-Cd battery, I used approximately 14 feet of monster wire, and I tied the whole mess together with Sermos* Power Pole connectors. (These are the only connectors I know that can handle 100 amps.) To measure the current, I used a 100W, .01-ohm, 1-percent resistor in series with the shorting wire.

VOLTAGE-DROP TEST

In keeping with the Zeta Xtra's high power-handling capability, I decided to measure the voltage loss across it at 20 amps, instead of the 12 amps I usually use. I used a digital voltmeter to take input- and output-voltage readings; the difference between the two gives the voltage drop across the SC. If you know the voltage drop at a fixed current of 20 amps, you can calculate the controller's resistance: resistance = voltage drop ÷ by 20 amps. I measured the voltage drop from

end to end on the battery and motor wires (including any connectors), and at the 2-inch point along the wires. The first reading shows the voltage drop of the controller in its stock configuration; the second is a standard measurement with which I compare all the controllers I test.

With 12 volts applied and 20 amps of current flowing, the end-to-end voltage drop was .28, which gives a resistance of 0.014 ohm. (This includes the voltage drop across all the motor and battery wires and the Tamiya-style battery connector that came installed.) I recorded a .11V drop at the 2-inch wire point—a resistance of .005 ohm, which is impressively low for a unit that's rated at 36 cells.

LET-IT-COOK TEST

For the "let-it-cook" test, I jacked the current up to 40 amps by switching in all of the resistors in my load bank. My first attempt was cut short be-

cause my resistor load bank started to smoke! The extra current had exceeded the power rating of the load resistors. To cure this problem, I directed cooling air from a 20-inch fan across the load bank. The resistors still got very hot, but after 15 minutes, the Zeta Xtra was barely warm.

The unit is built out of a solid block of aluminum that resembles a brick, and all this aluminum acts as a heat sink for the FETs. The result is an SC that runs incredibly coolly. The Xtra has built-in, automatic thermal shut-down, but I doubt that you'll ever see it kick in unless you're having *big* trouble elsewhere in your car or truck.

DEAD-SHORT TEST

In the instruction book and on the box label, PDI claims that its controller will handle 36 cells, and this gives a good "voltage safety margin" at the 28-cell level. I decided to go for broke and see if the Zeta Xtra could handle a dead short with 28 cells. I installed a 14-foot shorting buss (made of 13-gauge monster wire) across the motor leads in series with the 100W, .01-ohm, 1-percent resistor. Then I chopped off the Tamiya-style connector and replaced it with a Sermos Power Pole connector (Tamiya-style connectors will melt at 100 amps).

With the throttle set at full and the batteries smoking, I took current readings every 10 seconds for 1 minute. At the start of the test, the current jumped to 105 amps; at 20 seconds, it was 73 amps; at 30 seconds, 71 amps; and after 60 seconds, it had fallen to 40 amps.

I suspect that the rapid drop in current during the last 30 seconds was the result of the battery pack dying. The damage?—three cells shorted, one opened (after cool-down), and all the shrink wrap melted, split and went up in smoke. When running high-power setups, *be careful*: Ni-Cds can explode! Even after all this, the Zeta Xtra was just a little warm! I can sum up the results of the Zeta Xtra's lab test in one word—impressive!

IN-CAR TESTS

Believe it or not, it does get cold in December in Huntsville, AL. On the day I wanted to road-test the Zeta

PDI Zeta Xtra

DIMENSIONS:

Height	1.12 inches
Width	1.75 inches
Length	2.40 inches
Weight with wires	5 ounces

TUNING:

Access to controls	N/A
Ease of adjustment	Fair

PRICE:

Suggested retail	\$349.95
Warranty	90 days

ELECTRICAL:

(Manufacturer's specs)

Max. voltage	43.2 volts
(36 cells)	

Min. voltage	7.2 volts
(6 cells)	
Max. current	not stated
Continuous current	not stated
Resistance	not stated

TEST PARAMETERS:

Voltage	12 volts
Current	20 amps
Voltage drop to end of connectors	0.28 volt
Voltage drop at 2-inch point	0.11 volt
Resistance* to end of connectors	0.014 ohm
Resistance* at 2-inch point	0.005 ohm
BEC output, 6-cell battery	5.01 volts

*Resistance = Voltage Drop ÷ Current

COMMENTS:

This is the biggest, heaviest speed controller that I've ever tested, but its bulk helps it handle the heavy loads to which serious, modified pulling trucks are subjected. Rated for 36 cells, the Zeta Xtra is programmable and waterproof. Best of all, it can handle all the current a Ni-Cd battery delivers into a dead short and stay cool! If you want to run heavy, multiple-motor trucks without worrying about controller burnout, the Zeta Xtra is the way to go. Although it lacks brakes, it's a good general-purpose controller that works well with as few as six cells. With its Velcro® mounting and quick reprogramming, it could service a whole fleet of trucks and cars! Now you can go truck pulling one weekend and off-road truck racing the next!

Xtra, it was cold, wet and miserable, so my only choice was to take it to an indoor carpet track.

I mounted the Zeta Xtra in my Bolink Eliminator. (Surprisingly, it fits very nicely in a 1/10-scale pan car.) Because much of the Xtra's bulk results from its height (rather than its length or width), I was able to mount it on the platform usually used for installing an SC in a Bolink car. If you install Sermos Power Pole connectors and use the supplied Velcro® mounting system, you can run the Zeta Xtra in monster trucks and 1/10-scale cars.

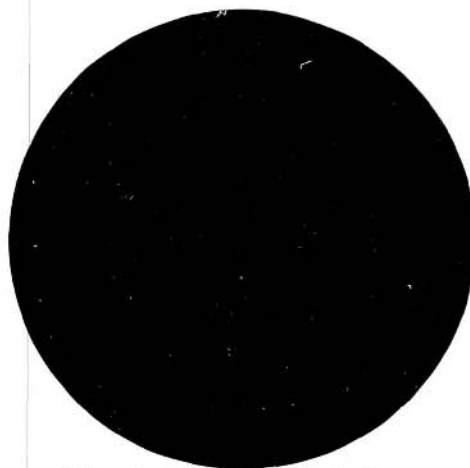
With the car, charged batteries and pistol-grip radio in hand, I headed to the track. A 1/10-scale pan car running a stock motor and a 6-cell battery pack isn't much of a challenge for the Zeta Xtra, but it gave me a chance to play with the programmable acceleration and throttle curves. With nine trigger-response curves and 32 acceleration curves, you're sure to find a setting you like.

I was having traction problems, i.e., the car spun out when accelerating out of curves. I found that the best setup was to have the trigger-response curve at "linear" and the acceleration rate at R4 (112 seconds). With this setting, I managed to crank out 63 laps (the track record is 71). Even though my Bolink wasn't properly dialed-in—it has some minor rear-wheel hop and an annoying tendency to oversteer—with the screaming Zeta Xtra, I cranked enough laps to make the A-main on almost any Saturday night! The big news is that the Zeta Xtra stayed *ice cold*. I let several drivers touch the controller right after runs, and their reaction was always the same—total disbelief!

CONCLUSION

The Zeta Xtra is big and heavy, but it was designed that way to handle incredibly high currents at very high voltages. To match it to your transmitter, program its internal micro-computer. With the hand-held programmer, you can also set the start of throttle, end of throttle and

(Continued on page 123)

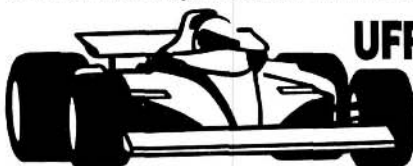


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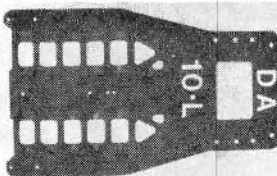
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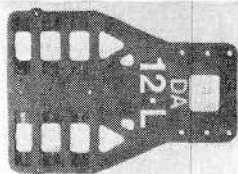
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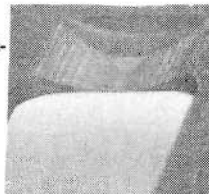


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NORRCA NATS

(Continued from page 78)

Open. Team Associated accepted the team cup, and TQ pins went to Jon Vandervort and Chip Reisbol.

Congratulations to all the winners, and thanks to NORRCA President J.R. Sitman and to Racer's Haven for staging this enjoyable national event. ■

TRUESPORTS

(Continued from page 70)

(the "winningest" car in drag racing's recent history), Geoff Bodine's Winston Cup Thunderbird and the Bud Light jet. These attractions provided us with fantastic entertainment, but for me, the real attraction was behind the doors of the TrueSports building.

BETTER THAN DISNEY WORLD!

Letting a car freak tour the facility where the ominous Indy cars are built is like letting a kid run wild in a candy factory! It was hard to decide what to look at first—the fabrication, sub-assembly and shock shop, the model making and composite

shop, the engine shop or the "Dyno" room?!

In the fabrication, sub-assembly and shock shop, I saw many of the parts developed by TrueSports exclusively for the Indy cars. Engineers and machinists were available to answer our questions, and as you can imagine, they were kept busy!

The model-making and composite shop is where many of the cars' composite pieces (e.g., fiberglass and carbon-fiber parts) are made. On display is a 1/4-scale replica of the Lola used by the TrueSports team. The models are made exactly to scale and provide the engineers with economical versions of the race cars to use in wind-tunnel tests, which aid in the development of body panels, etc.

At the heart of the facility is the engine shop where many of the powerplants' components are built and assembled. To ensure that no debris enters the engines during assembly (dirt could cause problems during a 500-mile race), this is a surgically clean environment.

The dyno room is a gear-head's dream! Here, the hard work of the engineers, fabricators and crew is finally put to the test. They can find whether there's a significant advantage or disadvantage to changes made on any of the engines'

components without ever putting the car on a track!

The dynos used by the TrueSports team are of the water-brake variety. In simple terms, a water-brake dyno uses a large water pump to provide resistance to the engine. Through a number of sensors, the dyno can determine—in fractions of a second—how much horsepower and torque the engine is developing. During the dyno demonstrations, engineers ran the Judd Indy car engine up to an earsplitting 13,500rpm! To the neophyte, it was just a lot of noise, but to car and engine buffs, it was a symphony!

INDY ON A SMALLER SCALE

Throughout the day, Chris Diedling and I charged batteries for the R/C Indy cars we had built—one in Budweiser drag and the other with the MAC Tools logo—for the visitors to try. The cars were a great success with the younger visitors, as well as with some of the older crowd. Many of them had never driven an R/C car, or had limited experience, but with a 30-second cram course on how to control one, most of them did pretty well. Paul Tracey and Scott Pruett even gave it a shot! Pruett had a little more success, because his car

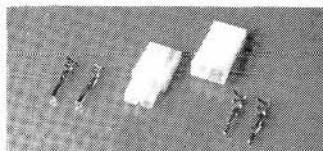
(Continued on page 118)

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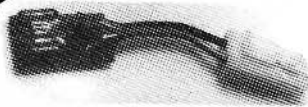
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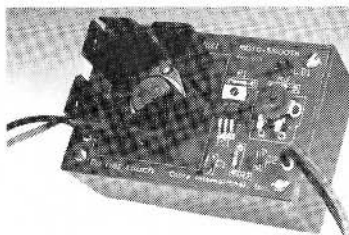
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*Racing for
Ronald
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ON A COLD October day, a race was held on an off-road track at the High Tech Hobbies facility in Enfield, CT.

Like many races around the country, drivers competed against the clock in qualifying rounds to earn themselves a place in a Main. On the surface, this race didn't seem special, but there was a twist: all the proceeds from the entry fees, raffles, etc., were donated to a local Ronald McDonald house.

Organized by High Tech Hobbies proprietors Tom and Barbara Longo, this one-day fund-raising event started with early practice runs. Despite the morning chill, local racers filed in to practice, and after a few hours, the track was closed and then thoroughly groomed.

In addition to the standard 2WD and 4WD Classes (with no distinction between Stock and Modified), there was a class for the increasingly popular racing trucks and a separate one for monster trucks. (Because they didn't think the monster trucks could compete with the new breed of racing trucks, the Longos created a separate

HIGH TECH RACEWAY CHARITY RACE

by STEVE POND

PHOTOS BY STEVE POND



Part of the High Tech race festivities was a visit from the Boss Hog monster truck.

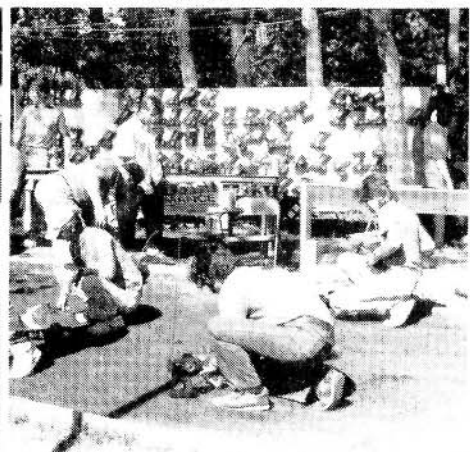
HIGH TECH RACE

class for them so that everyone would have a fair chance.) A lot of people participated in both truck classes.

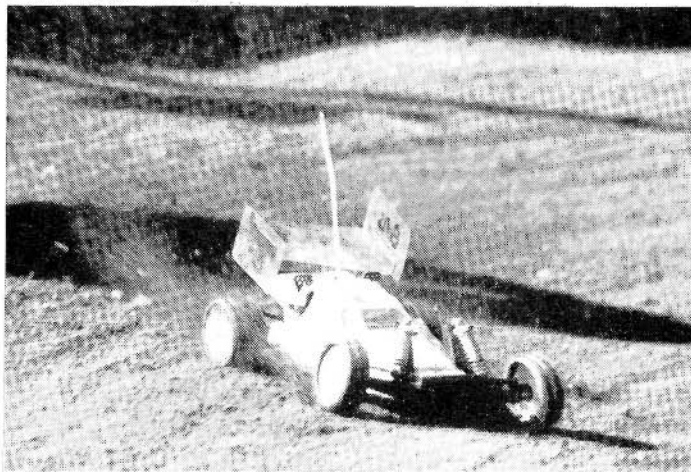
During the qualifying races, the track had a special visitor. Grimace (a character from McDonald's TV commercials) was especially popular with the younger participants, and they crowded around the radio-impound area for a look. Another pleasant distraction was an appearance by the "Boss Hog" monster truck. Local police had to stop traffic so that the Boss Hog could make its way to the track. The racing stopped, too, as everyone ran to the driveway to see this monster rumble down the street. It took up every inch of the two-lane road! Even patrons from the neighboring McDonald's lined the street to see the beast. Needless to say, it was a while before the racing resumed.

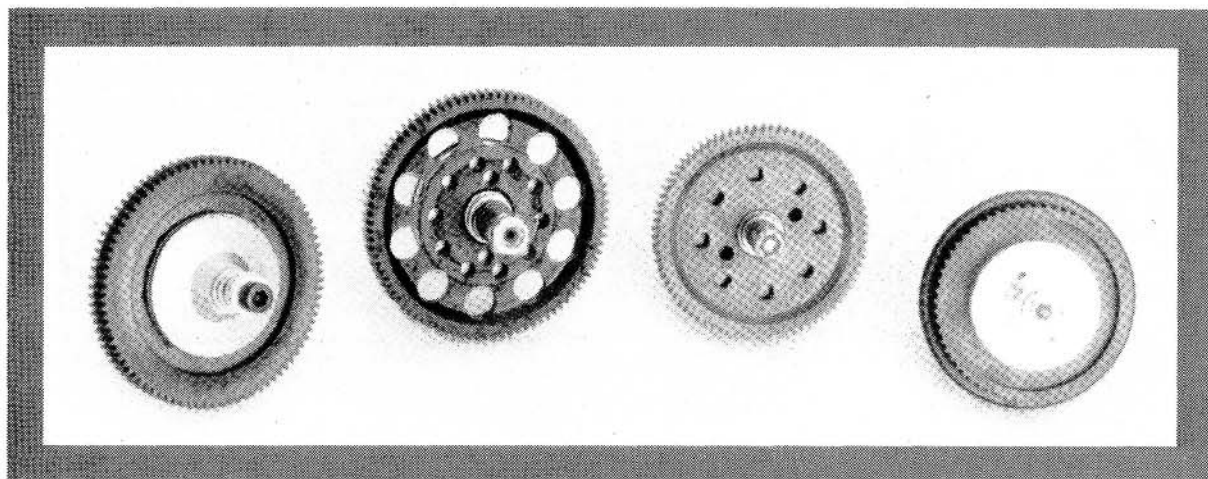
When the qualifying rounds had been completed, the main events began. Although I could list the racers and give you details of their performances, that's not what this race was all about. It was designed so that everyone could have fun while raising money for an excellent charity, and that's exactly what happened. At the end of the event, the winners in each class received trophies, and a drawing was held for prizes donated by a number of R/C manufacturers. (The response for donations was so great that every racer went home with at least two prizes!)

On behalf of the Longos and the rest of the High Tech staff, thanks go to all participants and contributors for making this event successful. These are the type of people and events that will ensure the growth of R/C. Anyone else out there feel inspired to do the same? ■



■ Top: the concours lineup was flanked by all the race participants. ■ Upper left: Grimace was one of the few McDonald's characters to visit the track during the event. ■ Upper right: marshalling the monster trucks was a little easier than usual as they were able to jump the barrier and land at your feet. ■ Lower left: the raceway patrol truck couldn't out-muscle this marshal.





Slip Slidin' Away

A guide to slipper clutches

by John Huber

WHEN YOU'RE racing on a dry track, do you have difficulty applying throttle without spinning your tires? You could loosen your diff until it slips, but the uneven slipping action will wear the diff components. A slipper clutch—one of the newest performance add-ons—will solve this problem. A variety of designs are available from various manufacturers, but basically, all slipper clutches function in the same way.

- A slipper clutch limits the power that's delivered to the tires. By controlling this power, you can achieve faster starts and decrease

your chances of spinning out. A slipper can be set to slip for 2 to 10 feet from a dead stop. The more it slips, the more heat it generates; so the less its slip to get the job done, the better. It also acts as a "breaking point" in the drive system. If you run your car against a brick wall and apply full throttle, you'll probably grind your gearbox to dust, because there's no "give" under this much stress. With the slipper, the motor will turn, but the power won't reach the gearbox. (Don't do this for more than a couple of seconds, because the slipper will become very hot.)

- You're also less likely to chew up a gear when you land from a jump at full throttle, if you use a slipper clutch.

- With a slipper, there's less wear on the gears and the axles, and the differential no longer has to limit the power to the wheels. Now you can set the diff to a specific track and set the slippage to work independently. By limiting the power from the motor, much less stress is put on the system. (Have you noticed the notches that are worn into the

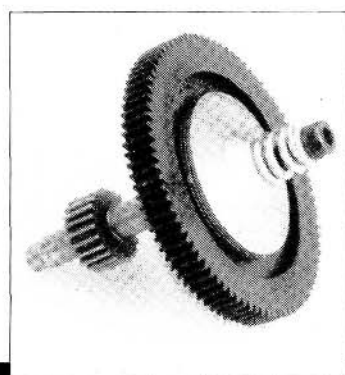
rear axles of an RC10 where the dogbones sit?)

MIP

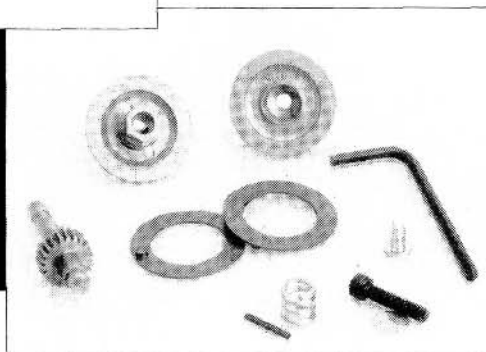
About a year ago, I installed an MIP* slipper in my RC10. The system consists of two steel plates that clamp the spur gear from both sides. Two thermal plates snap into the spur gear to provide a slipping surface. By tightening the hex bolt on the end of the unit, the pressure applied to the spring is increased and slippage is reduced. The unit is well designed, simple to use, and it has only a few parts that will need servicing. If, however, you want to replace the spur gear, you'll have to readjust the slipper's setting. Also, the thermal plates don't fit every spur gear on the market, so this limits your selection. (They do, of course, fit MIP spurs perfectly.) The slipper that's available for the MIP tranny costs \$19.95 (SL-100), and the one for the Losi tranny (it comes with output shaft and gear) costs \$29.95 (L-300).

TEAM PIT STOP

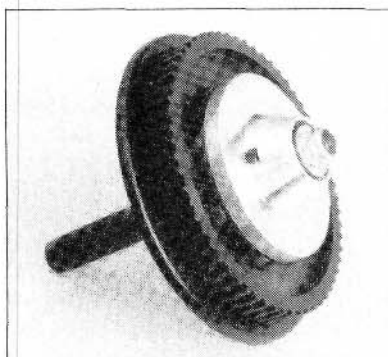
The Team Pit Stop* slipper design is similar to that of MIP's in that the spur gear is clamped



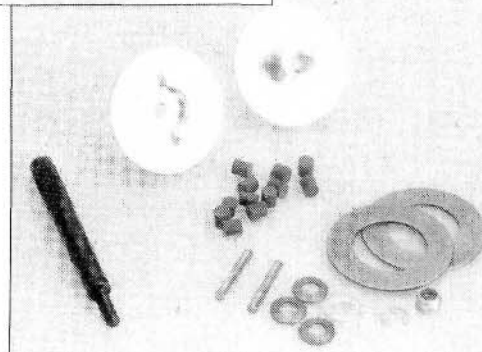
A low parts count and heavy-duty components make the MIP slipper simple and reliable. Note the pegs on the thermal plates that key them into the spur.



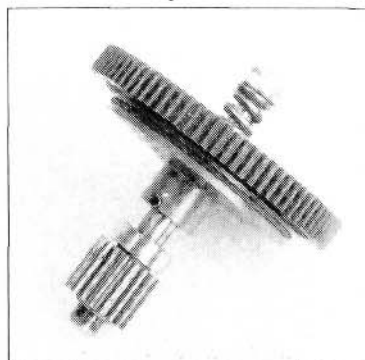
between two plates. Instead of diff balls, small Rulon® pegs are placed in the spur gear, which are then clamped between two aluminum plates that have steel rings on them. Tension is applied with cone washers. With this unique design, you can control the peg pressure by adding or removing pegs. These units are light, they have few small parts, and they come with output shafts. At \$34.99 each, they're available for Team Pit Stop (9015-S), Losi (9015), Track Master (9015-B), MIP (9015-M) and Schumacher's Top Cat and Cougar (9015-T).



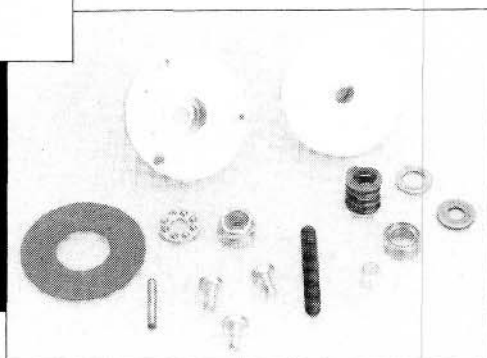
The TPS slipper features Rulon® pegs, which can be added or removed to alter slippage. The standard-size, steel diff rings should never need replacement.



PHOTOS BY YAMIL SUED



With A&L's Power Clutch design, you can remove the spur without losing your setting. The large Rulon® discs should last a long time.



ALLEC & LANE

Unlike the MIP and the Team Pit Stop slippers, the A&L* unit uses two aluminum plates to clamp a Rulon® disc. The spur gear is bolted to the outer plate. The plates don't clamp the spur gear, so you can replace them without losing your gear setting. Tension is applied to the plates by tightening the nut on the center shaft. For smooth slipper action, a ball bearing and a thrust washer are mounted below the spring, and this is important for starts. The unit is light, and the bolt-on spur is a great feature. To help you

align the spur and pinion properly, a motor spacer is included in the kit. Like the MIP, not every spur gear is compatible because of the unique three-bolt pattern. The A&L and MIP (no. 280) units are \$38.95 a piece, and the Losi (which includes the output shaft) is \$42.95 (no. 280). An updated version for the new Losi Pro is also available.

TEAM ASSOCIATED

The Associated* slipper (called the Associated Torque Control) is similar to the A&L unit. It also clamps a Rulon® disc between two aluminum plates. To prevent wear and to provide a smooth slipping surface, the plates are truly anodized. As with the A&L, the spur gear can be removed without losing your setting. A ball bearing

slipper material. It withstands temperatures of up to 500 degrees Fahrenheit, and it doesn't wear rapidly—perfect for this type of application. Whichever unit you use, you'll notice the improvements on your first run. Increasing control on loose tracks will increase your speed and save you time and money, and you won't have to replace drive components as frequently. Get rid of that useless wheel spin, and slip your way to the front of the pack.

*Here are the addresses of the companies mentioned in this article:

MIP, 838 Edna Place, Covina, CA 91723.

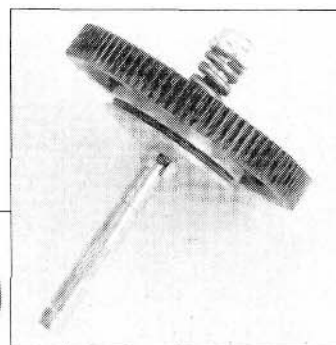
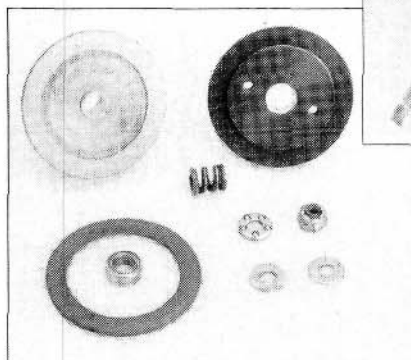
Team Pit Stop, 12233 SW 132 Court, Miami, FL 33186.

Allec & Lane Mfg., P.O. Box 2115, Corona, CA 91718.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626. ■

and a thrust washer are used to provide even slippage from a dead stop. Spur gears are mounted with two 4/40 screws on either side of the center hole. Like other spur gears, all Associated spur gears have holes for this mount. The ATC unit is only available for the new Stealth transmission, and, together, they sell for \$120.

Three out of four of these manufacturers use Rulon® for



Associated's aluminum plates are hard-anodized. The two-hole, spur-gear mount fits many different gears.

TRUESPORTS

(Continued from page 110)

handled better, but it was Tracey who was bitten by the R/C bug! Whenever he

could sneak out of the building for a few minutes, he came out to the track to run a battery through one of the cars.

The weekend was a great success for TrueSports and for the Easter Seals foun-

dation. A lot of money was raised for a worthwhile charity, and many racing fans were given a once-in-a-lifetime chance to sneak a peek at the inner workings of an Indy car team. Thanks to Kim Carmine and TrueSports Racing for inviting us to take part in such a fantastic event. It's encouraging that such an involved racing team regards R/C cars highly enough to want to have them as part of its fundraiser.

If you're passing through Ohio next fall, you might want to stop at the TrueSports facility during their open house so you can see all this for yourself!

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670 - 679 - \$5.50 each
680 - 689 - \$7.00 each

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285+ Packs - \$48.00
6 Cell Stick Pack
\$25.95

Sanyo 1200 SCR Cells

Ind. Cells
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TWISTER CYCLONE

(Continued from page 85)

some very competitive lap times.

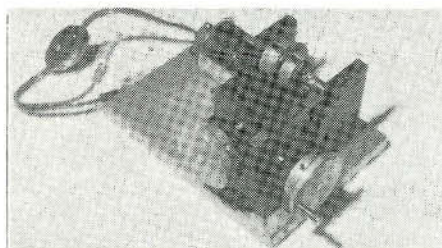
Now that I had the bugs out, it was time to see whether the Cyclone's performance could really blow my mind. I replaced the stock motor with a Twister "Blueprinted" 12-turn double and dropped in a fresh 1700mAh pack. These Blueprinted motors start as Yokomo hand-wound motors and

(Continued on page 121)

HOBBY ETC., INC.

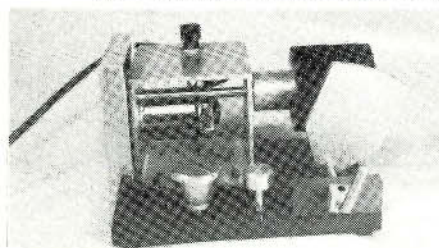
259 D.W. Hwy. So.
Nashua, NH 03060

SPEED CRAFT PRO MOTOR LATHE

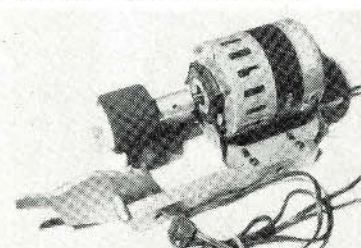


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AC or DC TIRE MACHINES ONLY \$150.00/each



Both Complete with 1/10 TRC Adapters.
& 64 pitch Super Low 8:1 gear reduction w/cover.



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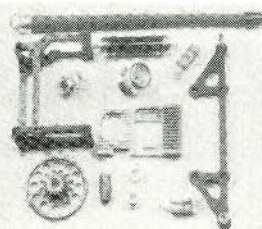
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COUNTER BEAM	30.00	30.00
FR. AXLE BEAM	26.00	29.95
ONE PIECE POD	69.95	79.95
BEARING ST. BLOCK	35.00	35.00
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HARDENED FR. AXLE	10.00	10.00
FR. AXLE SET	45.00	N/A
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RE. CLAMP HUB	14.95	19.95
LOCK DIFF. HUB	20.00	25.00

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Victor Hi IQ Sr.	\$339.99
Tekan 410	79.00
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SEND \$2.00 FOR CATALOG

Order Information

VISA & MC

C.O.D. \$4.95 S/H \$7.00

TWISTER CYCLONE

(Continued from page 118)

they're then super-tuned by the folk at Twister. (Tuning tips and extra sets of brushes and springs are part of the package.)

I can see why they call this car "Cyclone." It was a bullet on straights and a handful in turns. Unfortunately, I over-powered the suspension setup. When running at these speeds, there's a fine line between over-powering and getting it "just right," and I definitely crossed it. Fortunately, the Cyclone's uncomplicated chassis means that adjustments are easy to make, and the car was up and running in no time. After some tweak-screw fine-tuning and the addition of a Bud's* wing (mounted directly on the axle blocks, so there are no after-market wing mounts to increase weight), the car really came into its own.

The easy-to-assemble Twister Cyclone is a study in simplicity. Its low center of gravity, central motor pod and lightness are really great features. If you're tired of having to "chase" the handling of your current car, the Cy-

(Continued on page 123)

The Superstars Are Using BodyShop Paint



"Takes less time, eliminates steps, makes detail work a breeze, paint goes on smooth & easy, covers well. Product produces concours paint job."

—John "Hammer" Smith
J.G. Manufacturing

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Air Age Mail-Order Services, 251 Danbury Rd., Wilton, CT 06897



TWISTER CYCLONE

(Continued from page 121)

clone is a high-quality alternative.

*Here are the addresses of the companies mentioned in this article:

Twister Motors, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Novak Electronics Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

Pactra Inc., 620 Buckbee St., Rockford, IL 61104.

CKW Mfg., 1889 Commonwealth, Unit 1, Fullerton, CA 92633.

Bud's Racing Products, 1575 Lowell St., Elyria, OH 44035. ■

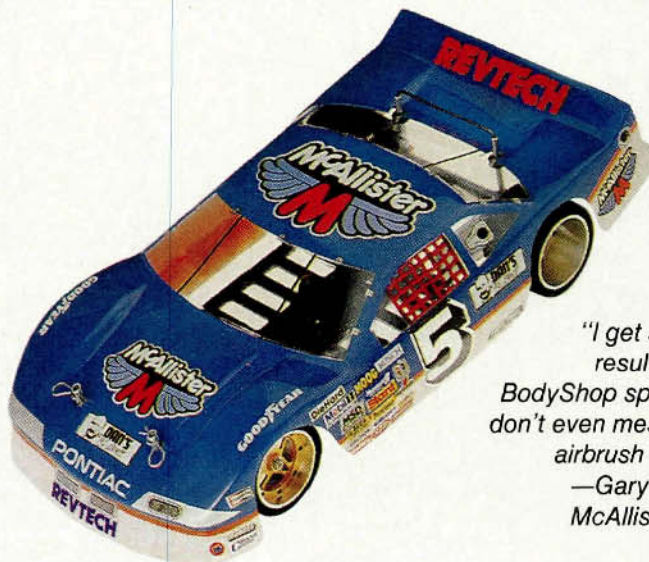
SCOPING OUT

(Continued from page 109)

forward and reverse end points. (The Zeta Xtra has no reverse, but you set both trigger end points, anyway.) All this is done with the transmitter trigger trim set to center and the trigger end points set to max. After being set-up, the microcomputer knows the correct range of the transmitter pulse. Any pulses that are outside

(Continued on page 130)

The Superstars Are Using BodyShop Paint



"I get such great results from the BodyShop spray cans, I don't even mess with the airbrush anymore."

—Gary McAllister
McAllister Racing

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custom conquest

DID YOU EVER NOTICE that the heavyweight champion's robe is more striking than those of his contenders? Perhaps the champ's robe is nicer, or maybe it just *looks* that way when worn with the shiny title-holder's belt. At any rate, if anyone deserves a beautiful robe—a closet full of them!—it's the champ.

Tamiya's* new Bullhead is basically the old

champ we know and love—the Clod Buster—in a new set of threads, complete with metallic badges. And why not! Other trucks from Tamiya and Kyosho have worn many outfits into battle. The Blackfoot and the Big Brute have both switched armor more than once, so why shouldn't the truck that's been the "king of the hill" for so long?



BULLHEAD

MRC

TAMIYA

BULL

by CHRIS CHIANELLI

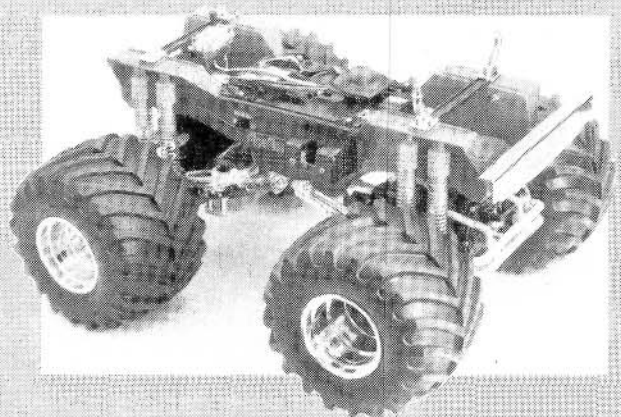
RE-DONE DUDS

There are only two areas in which the Bull differs from the Clod. The first, quite obviously, is its Kenworth/Diamond Rio-type body. Like the other ABS bodies produced by Tamiya—the house of the molding magicians!—the Bull's is well-detailed. In fact, I think it's the company's best effort yet.

PHOTOS BY YAMIL SUED



Except for reinforcements of the center section, the Bullhead chassis is a Clod Buster chassis molded in red ABS plastic.



TAMIYA BULLHEAD

Type Off-road monster truck
Scale 1/10
Price \$349.95

DIMENSIONS:

Overall Length 18.75 inches
Width 14.875 inches
Wheelbase 10.75 inches
Track (f/r) 10.625 inches

WEIGHT:

Gross (w/battery) 9 pounds, 14 ounces

BODY:

Type Semi tractor
Material Injection-molded ABS

CHASSIS:

Type Tub
Material ABS resin

DRIVE TRAIN:

Primary (f/r) Direct spur
Transmission Gear
Differentials Bevel spiders
Bearings/Bushings Plastic/metal

SUSPENSION:

Type (f/r) Live axle w/ladder arms
Damping (f/r) Oil-less coil-over shocks

WHEELS:

Type (f/r) One-piece chromed plastic
Dimensions (DxW) 2.625x3.75 inches

TIRES:

Front Terra
Rear Terra
Dimensions (DxW) 4 1/4 x 6 1/4 inches

ELECTRICS:

Motor RS-540S (2)
Battery 7.2V, 1200mAh, 6-cell flat pack
Speed Controller 3-step w/remote resistor

COMMENTS:

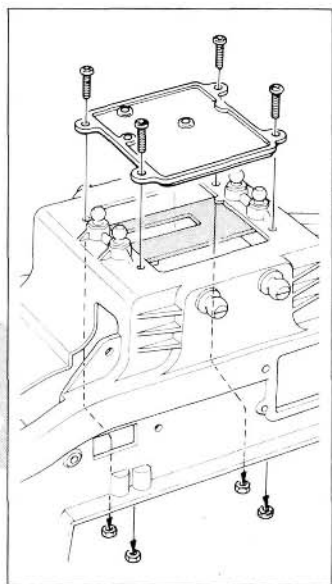
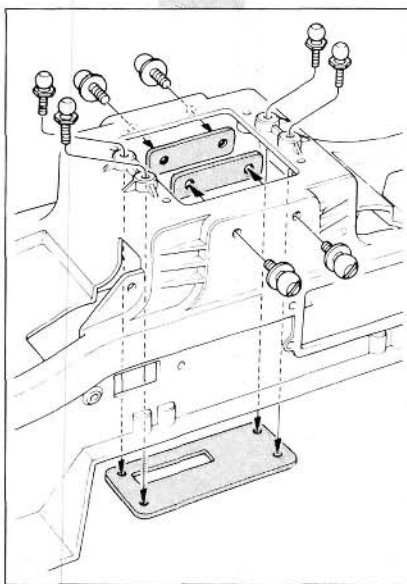
The Bullhead is basically a variant of the ever-popular Clod Buster. The Clod already had a reputation for handling dangerous terrain better than any other truck; the Bullhead has a substantially strengthened chassis midsection, so it's even harder. (There are three aluminum doubler plates and increased webbing molded onto the screw-hole bosses at the center of the chassis.) And then there's the body!—it's clean, well-detailed and the perfect topper for this barbaric monster truck.

The smoked windshield and all the chrome parts (tanks, grill, stacks, etc.) screw on—no glue is used. I really appreciated this feature during the test runs. At the order of Commander Smitty Pond, I sent the Bull charging up and down hills at high speed and rolled it many times, but none of the model's chrome parts broke off. (Because it's wide, the Bull doesn't roll more easily than a Clod; it just looks more top-heavy.) We subject

as obvious. The center of the chassis—where the Clod was infamous for having stress-crack problems—has been strengthened. One large and two small aluminum plates reinforce the sides and bottom of the chassis' middle. The eight ball connectors, to which the front and rear suspension/drive assemblies are connected, are screwed through the plastic chassis and into these plates, and this makes this area (which is under a lot of stress as a result of the moving units) much more durable. Otherwise, the Bull is built exactly like the Clod.

BUILD THE BULLHEAD

Although Tamiya's excellent instructions literally walk you

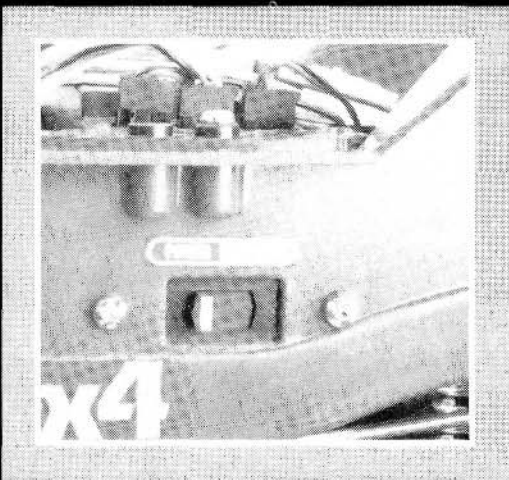


The ball links (to which the suspension arms are attached) screw into the new aluminum plates, and this should remedy the cracking problems common on the Clod Buster. Note the new molded-in gussets, which provide even more strength.

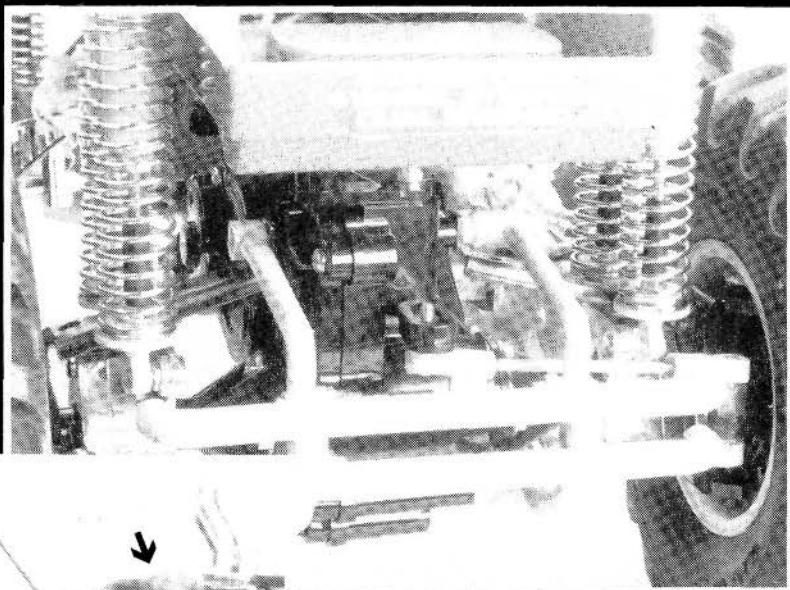
our test cars to this treatment so that we can get a feel for their durability in a short time; after all, we want to review new products for you as soon after their release as possible.

The other way in which the Bull differs from the Clod isn't

through the construction process (with super-detailed diagrams and actual-size drawings of the parts you need for each step), I'll discuss some parts, for those of you who have never built a Clod or who are new to the hobby.

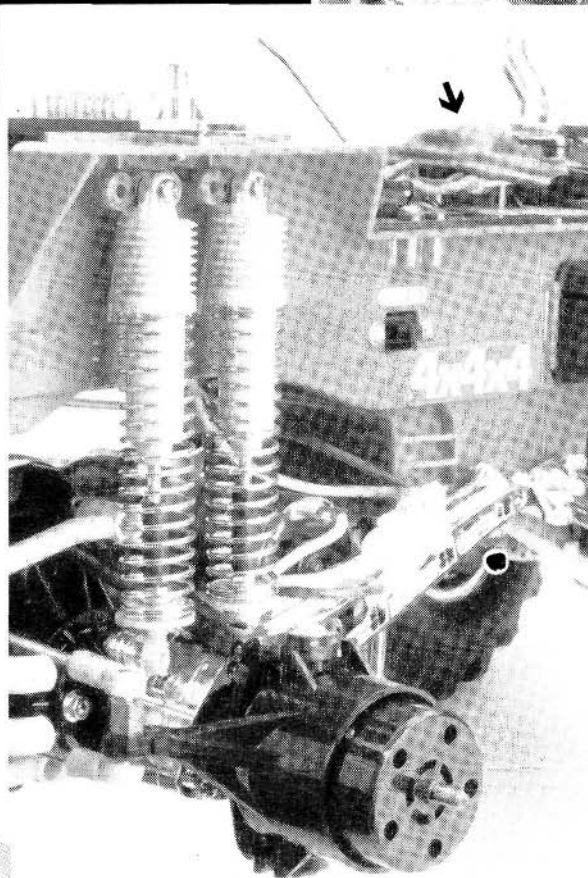


Above: The Bull's economy mode (series wiring) increases run time but decreases speed, while the power mode (parallel wiring) sacrifices run time for more get up and go.



Above: The front and rear case guards are yellow instead of Clod Buster red. Although the motors mounted on the front and rear suspension/drive units increase their unsprung weight, their rigid live-axle design is very durable.

Right: Although the Bull's suspension travel is only about $\frac{7}{8}$ inch, oil-filled shock replacements would help. The speed controller's dust cover (arrowed) keeps out mud and dirt.



The Bullhead isn't more difficult to put together than other cars—it requires the standard complement of shop hand tools—but its parts count is high. I suggest that you work on a large table (preferably a workbench) and use cups or small boxes to keep the loose parts organized during the various construction stages.

If you're thinking of using a new radio or a heavy-duty servo, perhaps this is the time. The Bull doesn't need a heavy-duty servo, but because its steering servo is buried in the chassis tub, it will take a lot of tearing-down to change it. A decision now is more convenient, but it's not critical.

The two-motor/two-diff system really digs in and makes things happen.

The two differentials are identical, and going through this construction procedure twice is the only monotonous assembly step. Tamiya includes plastic bushings in the kit, as it did with the Clod, but I don't think they're a good

choice for a vehicle that's subjected to such abuse. Plastic bushings will soon have to be replaced, so use bronze bushings, or ball bearings, if you can spring for them.

Tolerances will be tighter; speeds will be faster; and run times

will be longer.

The rest of the gearbox/suspension unit is fairly easy to put together and attach to the chassis. The shocks are the same as the Clod's—the air-damped type, or should I say the “no-damp” type?! What the heck—it's still a great truck. To

complete the chassis, you only have to mount the huge tires on the huge wheels and put them onto the axles! Now it's time to paint that beautiful tractor.

WHAT A BODY!

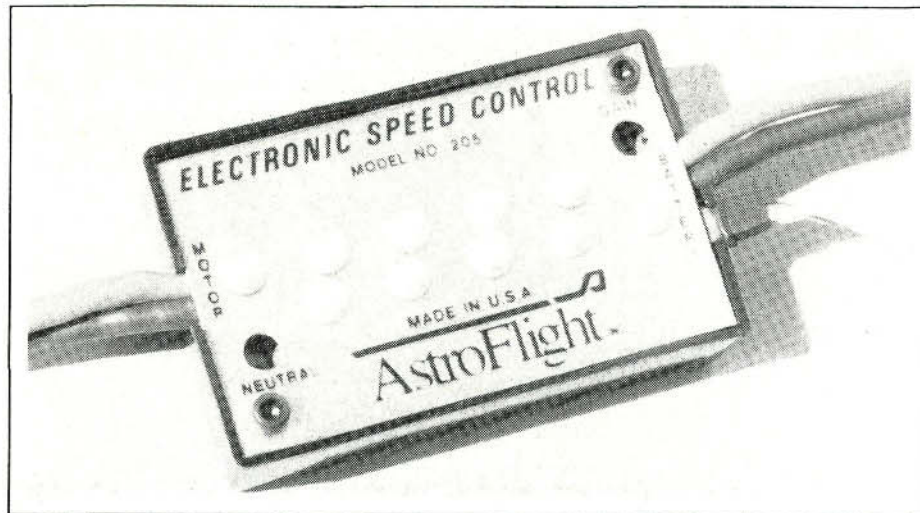
I love this body! The details from the injection molding, the chrome, the smoke windows and the decal sheet make this one of the most impressive out-of-the-box R/C models to ever come down the pike.

After you've trimmed off any molding flash (there was very little on mine), clean the body with a paper towel dampened with alcohol, or wipe it with a tack-rag. Now you're ready to paint. I used Coverite's* Body Shop yellow. This paint is designed for Lexan and works very well on all polycarbonates, but the opaque colors can also be used externally on ABS plastic. (I suspect that the metallic colors should only be used on polycarbonates.)

I like Coverite's Body Shop paint because it dries quickly and gives dust little time to settle on your work of art. You should still try to work in a ventilated area that's free of dust-causing agents (like younger brothers and sisters re-enacting “The Last Stand At Little Creek”!).

For me, four to five very light coats did the job, and there was very little waiting time between them. Don't try to paint it in one thick coat; you'll end up

(Continued on page 130)



Compromise No More

Awesome Dynamic Range

Astro's New Hi-Rate Electronic Speed Controls have the largest dynamic range available anywhere. They work with 6 cells to 32 cells...efficiently...They work with 50 Watt Ferrite 05 motors and 2000 Watt Cobalt 60 FAI motors.

100 Amps Pulling Power

Five IRF-Z40 MOSFETS, a special gate drive circuit, and a Built in Aluminum heat sink give the control a peak (1ms) rating of 700 Amps and a 30 second rating of 100 Amps. Power enough to handle twin 40 motors sucking 100 amps during Monster Truck Pulls.

100 Amps Braking Power

Four IRF-Z30 MOSFETS in the brake circuit have a peak rating of 500 Amps and a 5 second rating of 100 Amps. Powerful enough to safely stop a 80 mph Dragster. And the regenerative braking circuit pumps amps back into your nicads during braking.

Opto-Coupling

Opto-coupling eliminates any direct connection between the radio circuit and the motor circuit. Motor noise can't get back into your radio receiver and cause glitching.

Hi-Frequency Switching

Hi-Frequency switching is much more efficient than frame rate switching, especially at lower throttle settings. Motor heating is greatly reduced, motor runs are noticeably longer, and throttle response is extremely linear.

Signal Filtering

A special triple pole low pass filter in the decoder circuit produces a very smooth and precise speed command. Try it once and you will never want to return to the spastic control you live with now.

16 Amp Shotky Diode

This massive flyback diode greatly reduces switching losses during partial throttle operation. The control runs much cooler and more efficiently and your nicads run longer.

Three Custom Designs

MODEL 205 is designed for Monster Trucks. It features a soft start and soft brake for smooth precise handling.

MODEL 206 is designed for Drag Racing.

It has a hair trigger for low E.T. and a soft brake for smooth safe stops.

MODEL 207 is designed for Racing Boats.

It is water proof and has a soft start, but of course it has no Brakes.

No More Compromises

I designed our new Team Astro Hi-Rate Speed Controls with No Compromises. I gave them all the features that serious electric racers have been asking for. I hope you like them.

Bob Boucher

Astro Flight Inc. 13311 Beach Ave. .
Marina Del Rey , Ca. 90292

SCOPING OUT

(Continued from page 123)

this range are considered to be "noise" and are ignored.

You can also set the trigger-response and acceleration-response curves using the hand-held programmer, so you can match the Zeta Xtra to your driving style and track conditions. This controller's versatility is limited only by the time you're willing to spend on testing the throttle and acceleration combinations.

The only bad news is that you must take the time to read the instruction book and learn how to program the Zeta Xtra. It's not difficult, but it isn't obvious either, so read the directions! Be sure not to lose the instruction book: it contains all the codes for programming the various functions. I recommend that you make a copy of the program codes and tape them to the lid of your toolbox.

The big news?—the Zeta Xtra's reliability and raw power-handling capability. Few controllers can handle 100 amps at 28 cells and barely get warm. If truck pulling or drag racing is your game, Zeta Xtra is the name to choose. It's ideal for monster trucks that use multiple cobalt motors and batteries. (If you want reverse, try the Turbo Zeta.)

**Here are the addresses of the companies mentioned in this article:*

PDI, 16922 NE 124th St., Redmond, WA 98052.

Sermos R/C Snap Connectors, Cedar Corners Station, P.O. Box 16787, Stamford, CT 06905. ■

TAMIYA BULLHEAD

(Continued from page 128)

with a sloppin', messy "driphead" of a truck, and your friends will stop calling you.

When the paint is dry, you can apply the decals. Ever have a problem getting those things where you want them—with no bubbles—the first time? Here's a little trick: cover the area for the decal with warm soapy water (liquid dishwashing soap works best), and then attach the decal. If it's not in the right position, the soapy water gives you a chance to slide it around, or lift it off and try again. When the decal is in the right place, wipe it with a dry paper towel.

Spray on a few coats of Crystal Clear Krylon, let it dry, and then add the chrome. Your truck looks beautiful, the batteries are charged, and you're ready, Eddie!

(Continued on page 136)

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TAMIYA BULLHEAD

(Continued from page 130)

AT THE TRACK, JACK

Like the Clod, the Bullhead has a power/economy switch between the battery and the two Mabuchi 540s. In the power mode, the motors are wired in parallel so that both receive 7.2 volts, and run times are between 3 and 5 minutes. In the economy position, the motors are wired in series; they each receive half the voltage, but can run for up to 8 minutes. All testing was done in the power mode.

The Bull has very good acceleration, and considering its size and weight, its top speed is impressive. It's not as quick as lighter 2WD trucks, but that's comparing apples and oranges! Like its pickup truck relative, the Bull makes up for this deficiency when climbing. The two-motor/two-diff system really digs in and makes things happen; the Bull pulls itself over amazing obstacles! Like the Clod, there's not much that can stop the Bull.

The Clod has been the Titan top dog for so long that it deserves a new champion's robe—and what a great robe it is! This beauty is bound to inspire the creatively wild R/C bunch from coast to coast. If I

were you, I'd be on the lookout for "Operation Bulldozerhead" in upcoming issues of *Car Action*!

**Here are the addresses of the companies mentioned in this article:*

Tamiya/MRC, 200 Carter Dr., Edison, NJ 08817.
Coverite, 420 Babylon Rd., Horsham, PA 19044. ■

TRACK DIRECTORY

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we print this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send the track's name, address and phone number to **R/C Car Action Track Directory**, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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(Continued on page 154)

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(Graph shown represents actual coreadout of Reedy Modifieds motor.)



TRUCK STOP

by DAVE SPROUL

'91 truck news

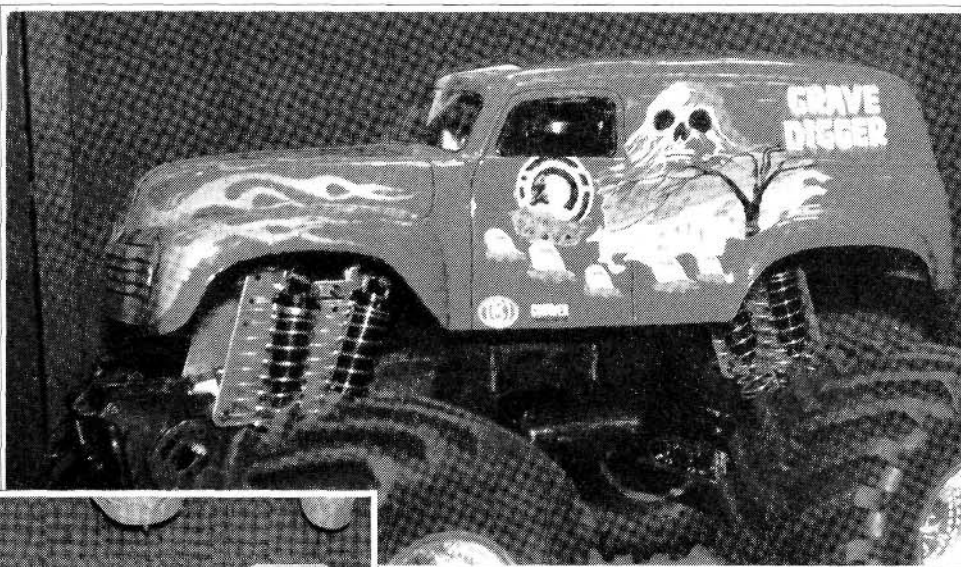
HERE WE ARE at the truck stop again! This month, I'll tell you about the interesting products that were unveiled at the Chicago RCHTA Show last November.

ESP Manufacturing* displayed a host of new accessories for the Blackfoot and the USA-1, including aluminum bumpers, body mounts, wheelie bars and wheel discs.

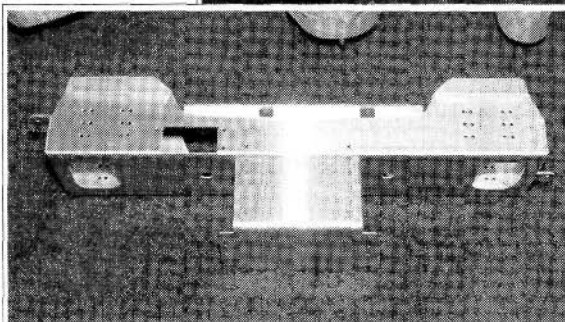
Sassy Chassis* showed off its new adjustable-height and 2-inch "stretch" Clod Buster chassis, as well as new chassis kits for the Blackfoot, the King Cab and the USA-1. The Blackfoot and King Cab chassis are available with or without a steering linkage; the USA-1 unit comes complete with bellcrank steering, hardware and chassis braces. Sales of these kits are brisk, and because of their high quality and strength, these units should continue to be popular.

Imex Model Company* introduced two low-profile tires: the Baja and the Jumbo Spiker. Both fit Clod Buster and USA-1 rims, so they should be popular with truck pullers and racers.

I also saw some new truck bodies, including the Gravedigger Chevy panel, the '57 Chevy Stepside pickup and the Bigfoot Shuttle Ford Aerostar minivan—all from Parma*. The Gravedigger is a licensed replica of Dennis Anderson's famous monster truck. Although it will fit any monster truck chassis, it should look especially good on the Clod Buster and the USA-1. The Aerostar is also a replica of a full-size monster truck—the Bigfoot 4x4's less well-known cousin, the Bigfoot Shuttle. This body fits the Lunch Box/Midnight Pumpkin chassis perfectly for a great scale look. The '57 Chevy Stepside is detailed and appears

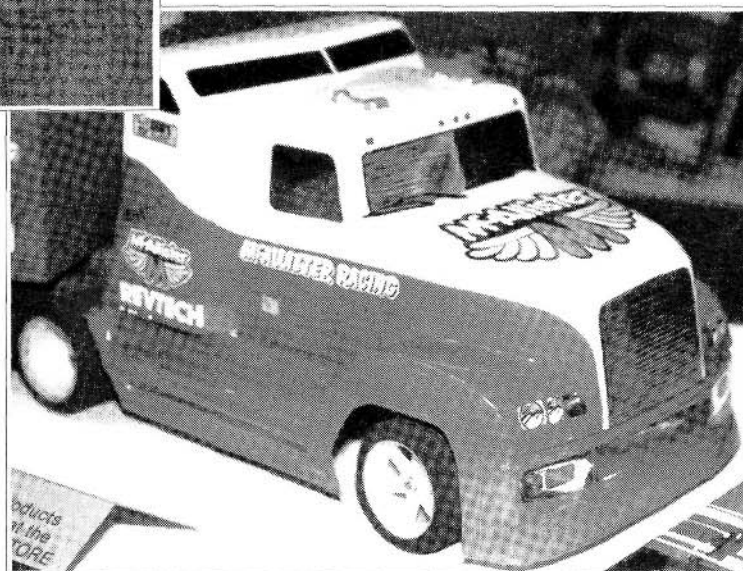


Above: The hot, new Gravedigger body should be popular with monster truck fans. It's shown here on Kyosho's USA-1 chassis, but it will fit any monster truck. Decals are included.



Above: Sassy Chassis' improved, adjustable, Clod Buster chassis.

Right: Here's one for you, semi fans!—McAllister Racing's polycarbonate semitrailer and tractor body kit.

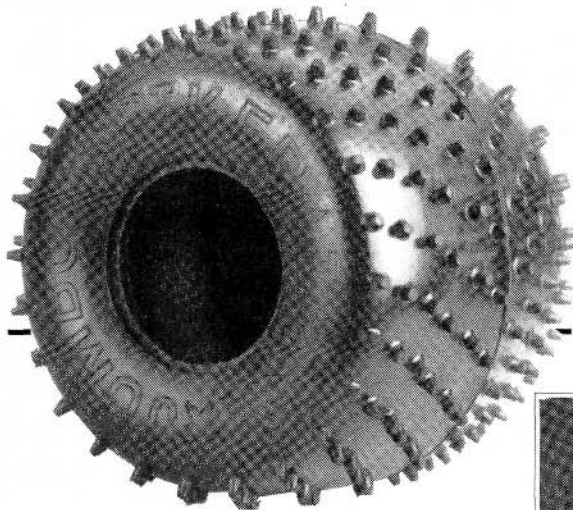


PHOTOS BY DAVE SPROUL

to be accurately proportioned. It would look good as a hot-rod street truck!

Last (but not least) on the new body list is McAllister Racing's* semi-truck, the Flyin' M. While not exactly scale, it's a good rendition of the late-model Freightliners. The body comes with a trailer and instructions, and it can be attached to any 1/10-scale, road-car chassis.

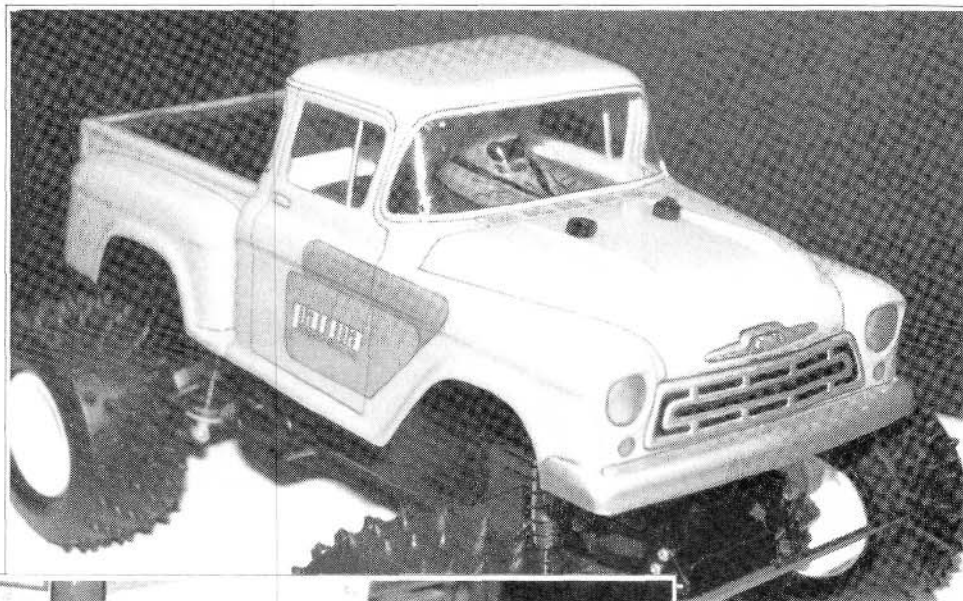
What new racing trucks were there?—the Bolink* Invader and Tamiya's* Toyota Hi-Lux. The Hi-Lux appears to be a Nissan King Cab chassis with a different body and new ribbed front tires. Tamiya also introduced a monster truck called the "Bullhead." Based on the popular Clod Buster, the Bullhead includes a semi body, lots of chrome and a red chassis. I'm sure it



The Imex Jumbo Spiker fits the Clod Buster and the USA-1, and it should be popular with truck pullers.

Right: The scale proportions of Parma's '57 Chevy Stepside are very good.

Below: ESP's new parts for the USA-1 include bumpers, skid plates and wheelie bars.

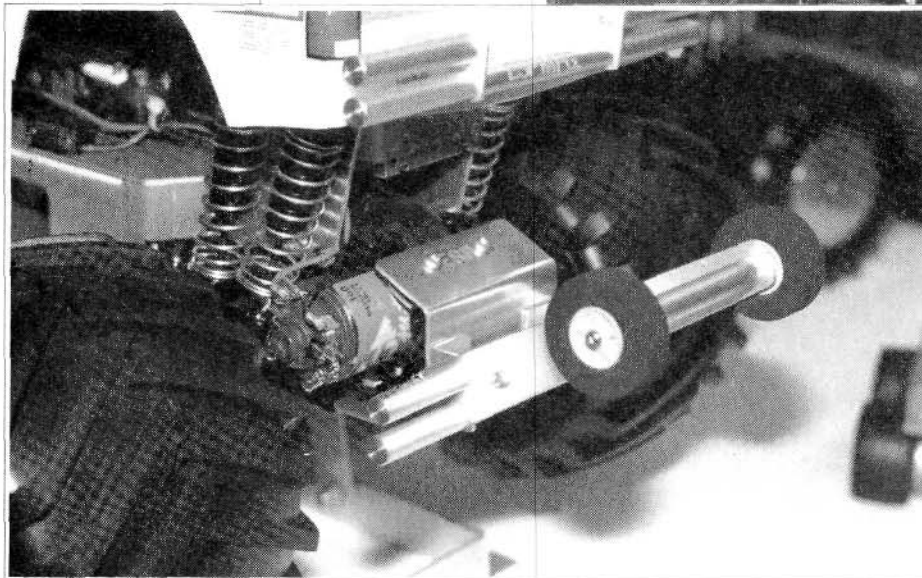


will perform as well as the Clod Buster, because the truck's basic design doesn't seem to have been changed.

Although the RCHTA show wasn't flooded with new truck products, there was enough to keep us truckers happy. I saw new monster-truck wheels from JPS* and Tecnacraft*, as well as the new

Sees* gold-centered wheels. I also saw a prototype of the four-link, cantilever Clod Buster suspension system, which includes sway bars and gives the truck an impressive 2 1/4 inches of wheel travel. (Since the show, I've heard that another company is working on a similar system.)

Also in the works is a cantilever system for Kyosho's* USA-1, which should be available in the spring. Speaking of the USA-1, I hear that Kyosho plans to release a gas-powered version soon. Based on the Kyosho



Burns off-road chassis, it uses 1/8-scale wheels, tires and body and requires a .21-size engine. This would be the first 1/10-scale gas monster truck to use such a powerful engine, and its performance should be spectacular!

Here's one sad note: I just learned that, owing to financial problems, R/C Research Engineering (manufacturers of Black Magic Products) has been forced to close its doors. Owner and motor-winder extraordinaire Tom Aument has been a real help to truck pullers, drag racers and boaters over the years, and

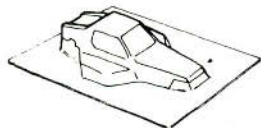
I'm sure he'll be missed. Good luck in your new endeavors, Tom, and we hope to see you back in the R/C industry some day.

That's all I have for this month, folks. Until next time, keep the shiny side up and go for the checkered flag!

**Here are the addresses of the companies mentioned in this article:*

ESP Manufacturing, 20 Crystal Lake Plaza, Crystal Lake, IL 60014.
Sassy Chassis, 204 S. Oak St., Itasca, IL 60143.
Imex Model Co., 53 Trade Zone Ct., Ronkonkoma, NY 11779.
Parma International, 13927 Progress Pky., North Royalton, OH 44133.
McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.
Bolink R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.
Tamiya/MRC, 200 Carter Dr., Edison, NJ 08817.
JPS, 1114 E. Truslow Ave., Fullerton, CA 92631.
Tecnacraft, 1335B Dayton St., Salinas, CA 93901.
Sees Precision Machine Works, 1414 W. 134th St., Unit 2, Gardena, CA 90249.
Kyosho/Great Planes Model Distributors, P.O. 4021, Champaign, IL 61824. ■

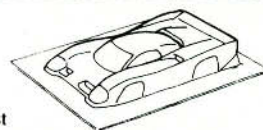
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(Continued from page 136)

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(Continued on page 162)

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(Continued from page 154)

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SUPER STAR

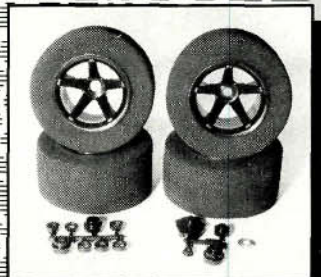
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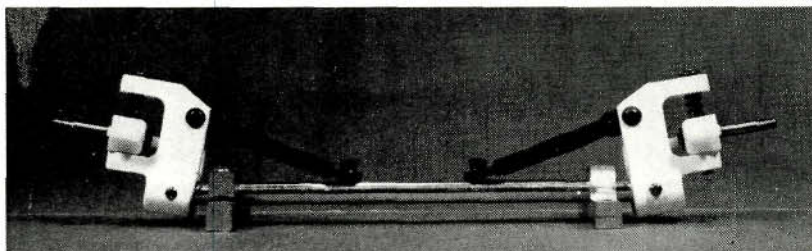
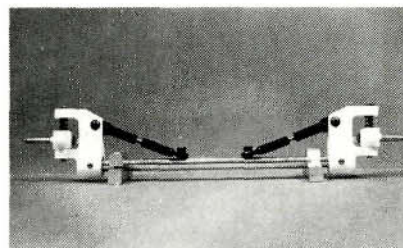
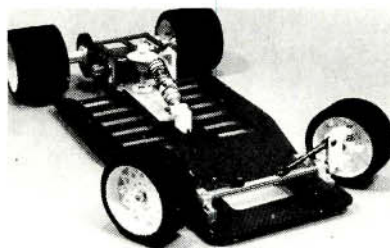
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(Continued from page 167)

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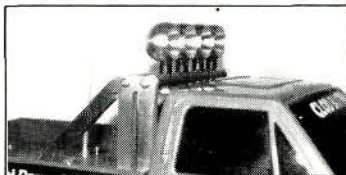
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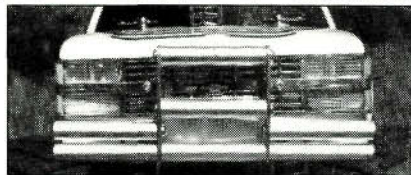
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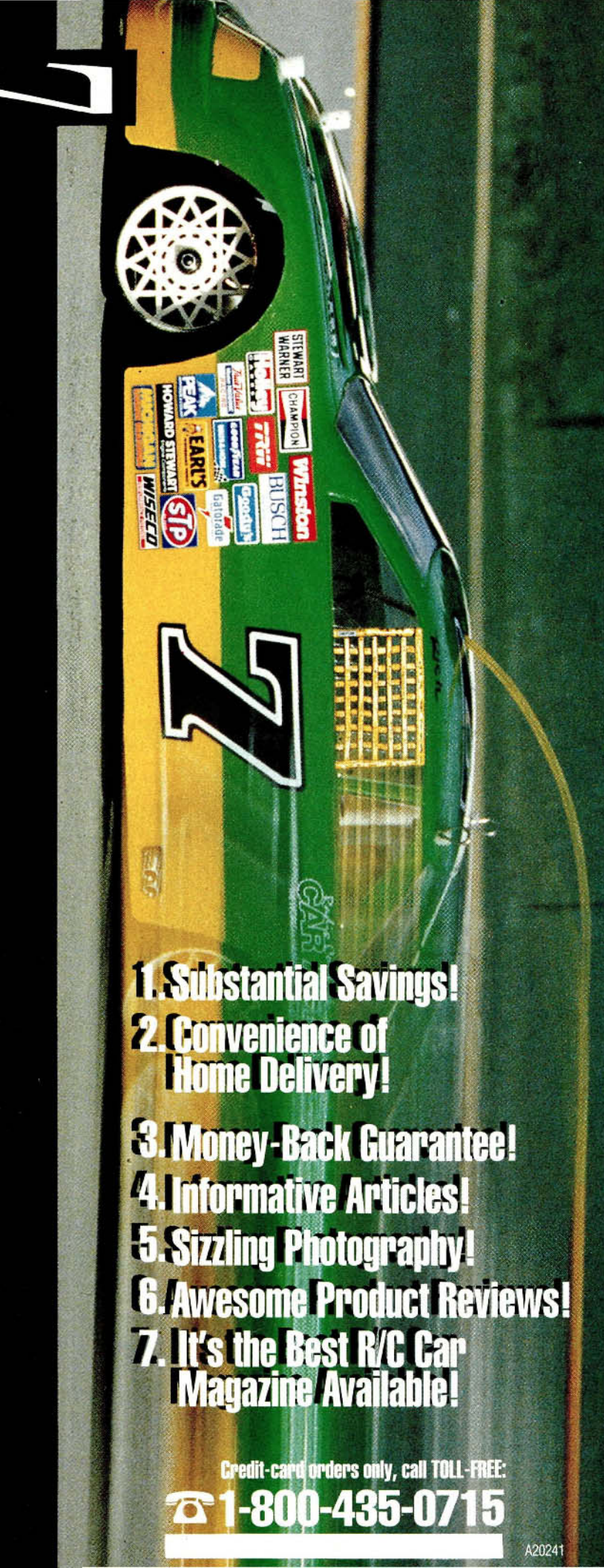
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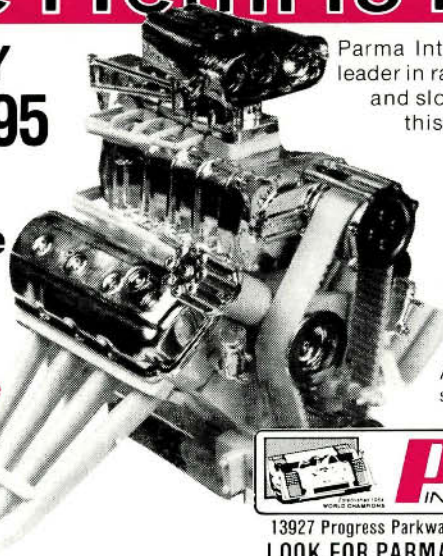
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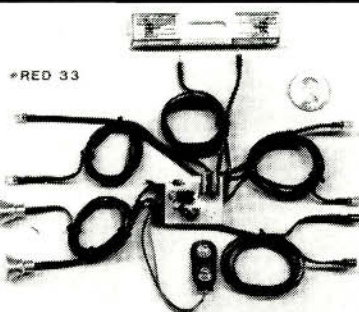
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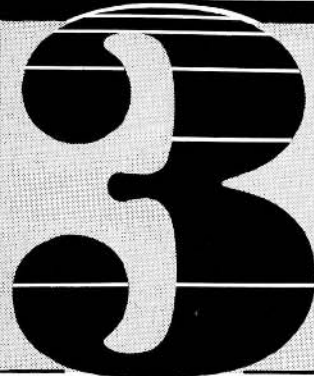


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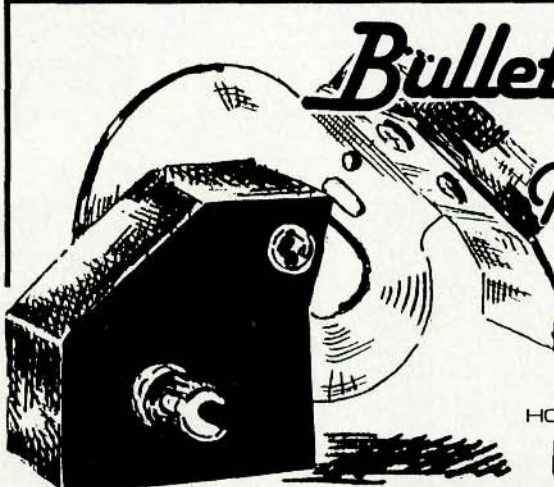
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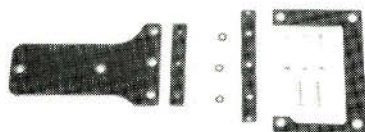
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NOVAK 410 MXC	139.99
NOVAK 610 RV	104.99
TEKIN 310	63.99
TEKIN 410S	89.99
TEKIN 411P	111.99
TEKIN 420	129.99
CORRALY MMS	124.99
PDI TURBO ZETA	199.99
PDI HYDRO ZETA	139.99

MOTORS

ALL STOCK	17.99
MACHINE WOUND MODIFIEDS	29.99
HAND WOUND MODIFIEDS	49.99

\$\$\$CALL FOR COMBO PRICING & SAVES\$\$\$

WHAT'S NEW



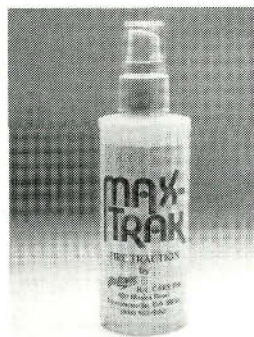
ADVANCED RACING TECHNOLOGIES Eliminator 10 Rear- Suspension Upgrade

Designed for Bolink's Eliminator 10, Advanced Racing Technologies' rear-suspension upgrade increases the pivoting action of the rear pod to give the car a greater range of damping, while a separate T-bar improves its rear traction.

Price: \$35
Part no. 9014

For more information, contact Advanced Racing Technologies, 460 Cypress Ln., Ste. F, El Cajon, CA 92020.

Mark Linder



BOLINK Max-Trak

Bolink's exclusive tire-traction formula—Max-Trak—has returned to the on-road-racing scene! Sold in easy-to-use spray bottles, it's a must for the pits. A little Max-Trak helps you go a long way—on carpet, asphalt, or concrete.

Price: \$6
Part no. BL-6029

For more information or a catalogue (\$3), contact Bolink, 420 Hosea Rd., Lawrenceville, GA 30245.



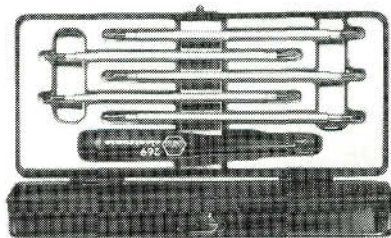
BOLINK '90 Dodge Daytona IROC

Straight from the high banks of Talladega to your hobby shop, Bolink brings you this accurate 1/10-scale reproduction of the sleek '90 Dodge Daytona IROC. This body was wind-tunnel tested to assure you of efficient aerodynamic performance. Put it on your favorite R/C car, and leave the competition behind!

Price: \$18
Part no. BL-2335

For more information or a catalogue (\$3), contact Bolink, 420 Hosea Rd., Lawrenceville, GA 30245.

Bob Rule

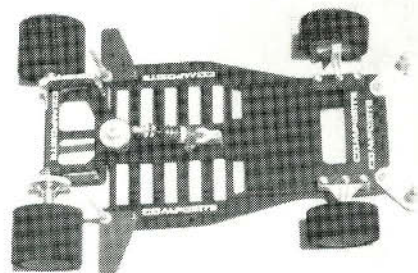


BONDHUS CORP. Reversible Tool Set

Wiha Tools now offers Precision Reversible Screwdriver Sets. These screwdrivers have the distinctive Wiha handle (tapered and with a fingertip rotation cup on the end). They have reversible, dual-tipped, hardened, plated-tool steel blades, which have precision oxide tips. Two sets come in a compact, durable steel box that makes them easy to transport and store. (All Wiha products are available in sets or individually.)

For more information, contact Bondhus Corp., 1400 E. Broadway, Monticello, MN 55362.

Lynn Wood



COMPOSITECRAFT Graphite Chassis

CompositeCraft introduces a graphite chassis for the Associated 10L.

Price: \$39.95
Part no. 10064.

For more information, contact CompositeCraft Inc., 5885 Lake Hurst Dr., Orlando, FL 32819.

Kim Davis collection



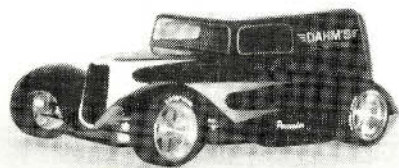
DAHM'S Terror

You can terrorize the competition with Dahm's new JRX-Pro racing body—the Terror. This low, narrow, super-aerodynamic Lexan body fits the JRX-Pro's frame closely. Its special, molded-in cooling vents help keep the batteries and the speed controller cool, and this provides more power and longer run times. The Terror is shown on the JRX-Pro with Dahm's Terror Power Pan (underbody) and the Turbo Cooler.

Price: \$17.98; \$29.98; \$10.98; \$26.98.

Part nos. D107; D107P (painted); D141 (Terror Power Pan under body); D108, Terror Combo (body and Power Pan).

For more information, contact Dahm's, P.O. Box 360, Cotati, CA 94931.



DAHMS Persuader

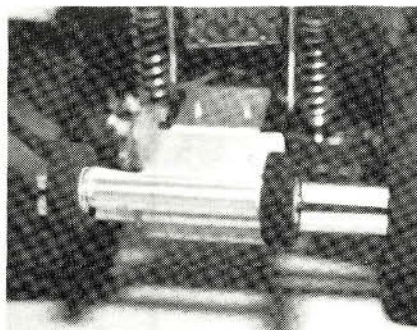
Dahm's new 1932 panel truck—the Persuader—fits most 1/10-scale cars. This realistic truck features a custom-chopped top and a sunroof, and an optional supercharger is available. It can also be built as a 1932 Ford sedan (just leave the rear window area clear!).

Price: \$19.98

Part no. D137

For more information, contact Dahm's, P.O. Box 360, Cotati, CA 94931.

Ira Dahm



ESP MFG. USA-1 Rear Lower Bumper

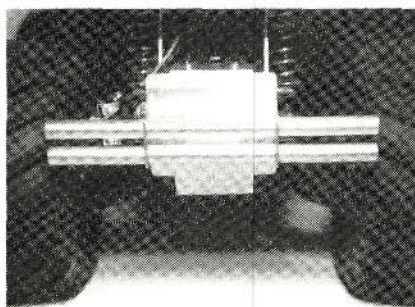
ESP's rear lower bumper with a skidplate can be bolted right onto the back of the USA-1's gear case. It also provides a place on which to mount ESP's Clodzilla wheelie bar (part no. ESP017).

Price: \$27.95

Part no. ESP027

For more information, contact ESP Mfg., 7105 Virginia Rd., Crystal Lake, IL 60014.

Chris Sutcliffe



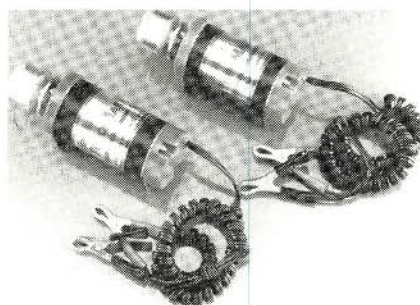
ESP USA-1 Front Lower Bumper

ESP's front lower bumper with a skidplate provides USA-1 owners with the ultimate in style and gear-case protection! The lower bumper also provides a place on which to mount ESP's Blizzard Buster Snowplow kit (part no. ESP015B).

Price: \$27.95

Part no. ESP026

For more information, contact ESP Mfg., 7105 Virginia Rd., Crystal Lake, IL 60014.



GREAT PLANES Electric Starters

Hobbico introduces two new high-powered electric starters: the Torqmaster 90 (for .90ci engines) and the 180 (for 1.80ci engines). Their features include: red endbells, molded-in stands to keep the switches clean, and 5-foot DC input cords that coil out of the way when not in use. These starters are perfect for airplanes, boats, helicopters and cars.

Price: \$49.95; \$64.95.

Part nos. HCAP3200; HCAP3300.

For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Chris Slater



HYPERDRIVE Hyperrings

Hyperdrive's large-diameter Hyperrings have been hardened and surface-ground to provide the smoothest surface possible. Their rears are textured so that they'll stay in place without glue or pins. Standard rings are available to fit all standard diffs.

Price: \$3.95

Part no. DR1001 (Hyperdrive); DR1002 (standard).

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.



HYPERDRIVE Delrin Hubs

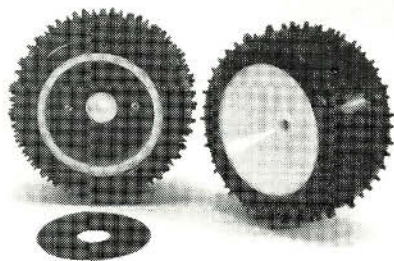
For peak efficiency, it's important to reduce rotational mass as far as possible. Hyperdrive now makes machined Delrin replacement hubs for the Hypertorque differential. They have approximately half the weight of aluminum, and they're extremely strong. To widen your car's wheelbase on one or both sides of the rear pod (for better oval and roadcourse dial-in capabilities), wider versions of these hubs are also available.

Price: \$17 *Snuffy Smith*

Part no. AC 0202

For more information, contact Hyperdrive Racing Systems, Inc., 3210 Howard Nickell Rd., Fayetteville, AR 72703.

WHAT'S NEW



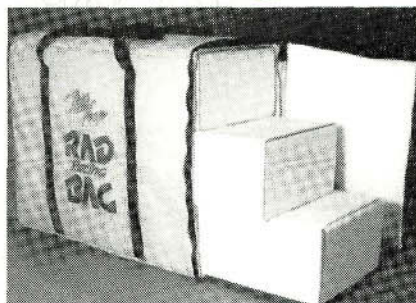
PRO-LINE Off-Road Wheels & Shields

To satisfy customers' requests, Pro-Line's new Cone Dish Racing Wheels have dirt shields. The wheels are of a very strong, light, nylon compound, and their unique cone design (combined with the rear-mounted dirt shields) retards dirt and sand in all types of off-road races.

Price: \$6.95/pair

For more information, contact Pro-Line Marketing Div., P.O. Box 849, Steamboat Springs, CO 80477.

Rick Grant



RACE PREP Rad Racing Bag

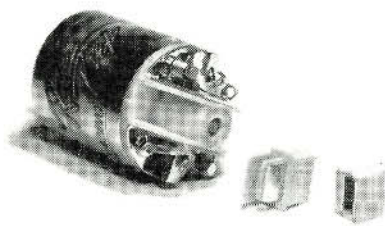
Get organized! Carry all your racing stuff in Race Prep's Rad Racing Bag! This 11x17x21-inch nylon bag has foam padding and three compartments to separate cars, parts, etc. It's available in fluorescent Hot Pink or Brite Yellow.

Price: \$43.95

Part no. 9997

For more information, contact Race Prep, 20115 Nordhoff St., Chatsworth, CA 91311.

Slitcher Dunn



RACE PREP Orange Pro Series Motors

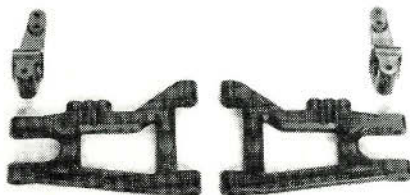
Effective immediately, the cost of Race Prep's Orange Pro Series stock motors with Fine Tune Concept is reduced to \$25. Engineered by Mike Dunn, the race-ready series includes silver "R"-compound brushes and stainless-steel, tensioned brush springs. Also included is a Pro 2 Connector (retail value, \$2.50).

Part nos. RP-9030 (off-road);

RP-9031 (on-road/oval).

For more information, contact Race Prep, 20115 Nordhoff St., Chatsworth, CA 91311.

Slitcher Dunn



RPM Wide Rear Truck Arms

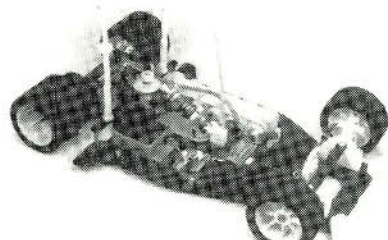
RPM now makes extra-wide rear arms for RC10 truck conversions. The heavy-duty arms are very stiff, and they come with specially designed outside carriers. Their geometry is excellent, and they increase the car's rear width to 12³/₄ inches—just under the 13-inch ROAR limit! The package includes a list of easy-to-obtain parts, complete with part numbers. All RPM products are guaranteed unbreakable!

Price: \$13.95

Part no. 7095

For more information, contact RPM Custom Engineered RC Products, 14978 Sierra Bonita Ln., Chino, CA 91710.

Richard Rorpe



TEAM ASSOCIATED RC10L Super Speedway

The RC10L Super Speedway is based on the Nationals-winning RC10L on-road racing car. It's designed for larger, banked, oval tracks (i.e., Whip-poorwill) and velodrome-type tracks (i.e., Thunderdrome). The RC10L Super Speedway has a much narrower body, so it's subject to less drag and therefore provides you with longer run times. The kits don't include bodies, batteries, motors, radios, or speed controllers.

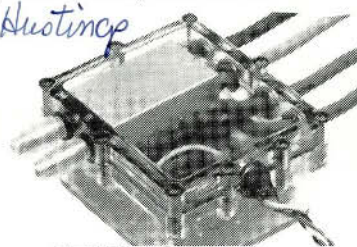
Price: \$170; \$235.

Part nos. 8005 (fiberglass chassis);

8006 (graphite chassis).

For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Gene Huotings



TEAM NOVAK Hydro-Cooling Systems

The Team Novak Hydro/Cooling Systems give R/C electric boats the latest in ESC technology. These systems completely enclose and adequately water-cool most Novak speed controllers in any sport or competition boat.

Price: \$30

Part nos. 6400 System I (for the

Novak 828-HV, MXc,

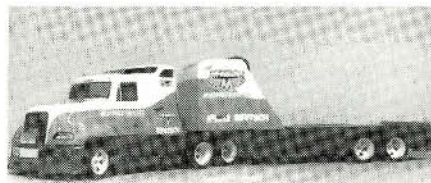
T1X, T1, or T4); 6410

System II (for the Novak 610-RV).

For more information, contact Novak Electronics, Inc., 128-C East Dyer Rd., Santa Ana, CA 92707.

Robert Novak

WHAT'S NEW



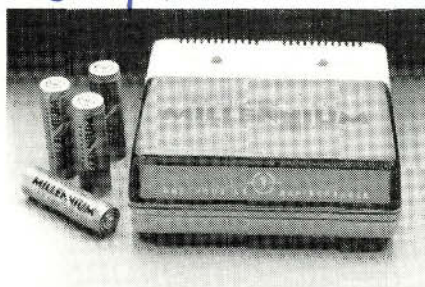
McALLISTER RACING The Ultimate Race-Car Hauler

McAllister Racing introduces the ultimate 1/10-scale race-car hauler—the flyin' "M" 18-wheeler. You can adapt the tractor and trailer body parts to suit your wildest truck creations, and you can attach the tractor body to the chassis of any 1/10-scale pavement car. The instructions give you ideas for completing your rig so that you'll arrive at concours events in style!

Part no. B-147 (tractor);
B-148 (trailer).

For more information, contact
McAllister Racing, 2245 First St., Unit
105, Simi Valley, CA 93065.

Gary McAllister



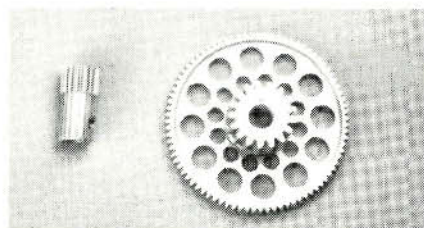
MILLENNIUM One-Hour Battery Charger

The new Millennium Power System is the first affordable 1-hour battery charger. The One-Hour Millennium AA RapidCharger charges two or four AA Millennium Power Cells.

Price: less than \$25

For more information, contact
Gates Energy Products, Inc., P.O. Box
114, Gainesville, FL 32602.

Jeff Jeter
Red Schofield
Schofield
Richard Sticker



NOVA RACING PRODUCTS All-Steel Blackfoot Counter Gear

Nova introduces its all-steel counter gear for Tamiya's Blackfoot trucks. This durable, precision-machined, hardened, 48-pitch gear is as free of friction as possible. It includes a pinion gear.

Price: \$39.95

Part no. SP-79

For more information, contact
Hobby Etc., 295 D.W. Hwy., Nashua,
NH 03060.

Frank Yen



PARMA Diet Coke Decal

Catch the next wave of decal mania! With Parma's new Diet Coke decal (shown mounted on a Parma Jeep Honcho body), it's easy to make an ordinary body beautiful.

Price: \$4; \$19.

Part no. 10694 (6x8-inch decal);
10250 (Jeep Honcho, clear).

For more information, contact
Parma International, Inc., 13927
Progress Pky., N. Royalton, OH
44133.

Jeff Landis



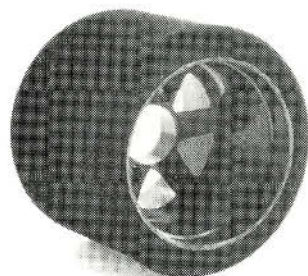
PARMA Diet Pepsi Decal

Get your body in shape with Parma's new Diet Pepsi decal (shown on a 1/12-scale Datsun Big Bear pickup). It's definitely "hot"!

Price: \$4; \$16.

Part nos. 10695 (6x8-inch decal);
10228 (1/12-scale Datsun Big Bear
pickup).

For more information, contact
Parma International, Inc., 13927
Progress Pky., N. Royalton, OH
44133.



PRO-LINE On-Road Tire Series

Pro-Line's new on-road tires and wheels will impress serious on-road racers. Made of an advanced racing compound that provides longer run times and improves acceleration, the tires come in soft, medium and firm compounds that maximize traction in all types of conditions. Each is mounted, trued to a .002 total run-out and balanced to ± 1 gram. The wheels are guaranteed for the life of the tires.

Price: \$4.95 to \$12.95/pair

For more information, contact Pro-Line Marketing Div., P.O. Box 849,
Steamboat Springs, CO 80477.

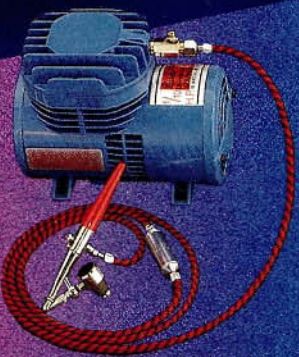
Fine Finishes



The finish on your model can only be as good as the airbrush you begin with...

...Count on Paasche airbrushes and accessories for a fine finish everytime. The largest selection and finest quality. For more information see your dealer or contact:

Paasche Airbrush Co.
(Dept:RC) 7440 W. Lawrence
Harwood Heights, Illinois, 60656-3497 708/867-9191



TRACK DIRECTORY

(Continued from page 199)

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621 SE Stallings Dr., Nacogdoches, 75961
Bryan Johnson (409) 560-1479

NORM'S R/C HOBBIES & RACEWAY

2551 Lombarsy Ln., Suite 160, Dallas, 75220
(214) 357-3453

HOBBY & TRACK OF BEDFORD

2900 St. Hwy. 121-A,
Suite 135, Bedford, 76021
(817) 267-6745

PIT STOP HOBBIES & RACEWAY

2013 Lamar Dr., Round Rock, 78664
(512) 244-2776

CAPITOL R/C RACEWAY

South Chisolm Trail Dr., Round Rock
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5211 John Stockbauer Rd., Victoria, 77904
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ARROW HOBBIES

2710 So. 1-35W, Burleson (817) 295-2821

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MORE TRACK DIRECTORY**

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